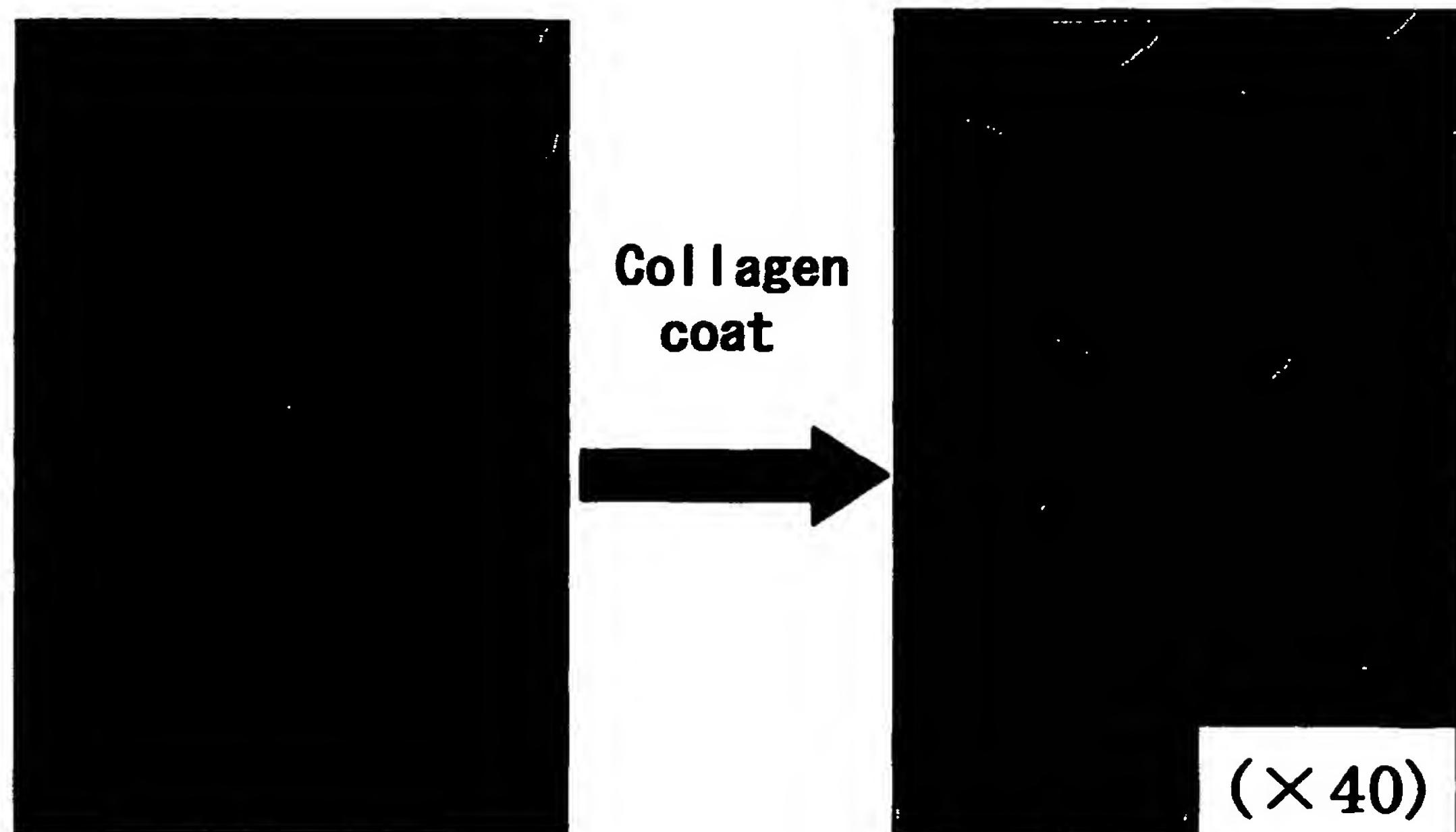
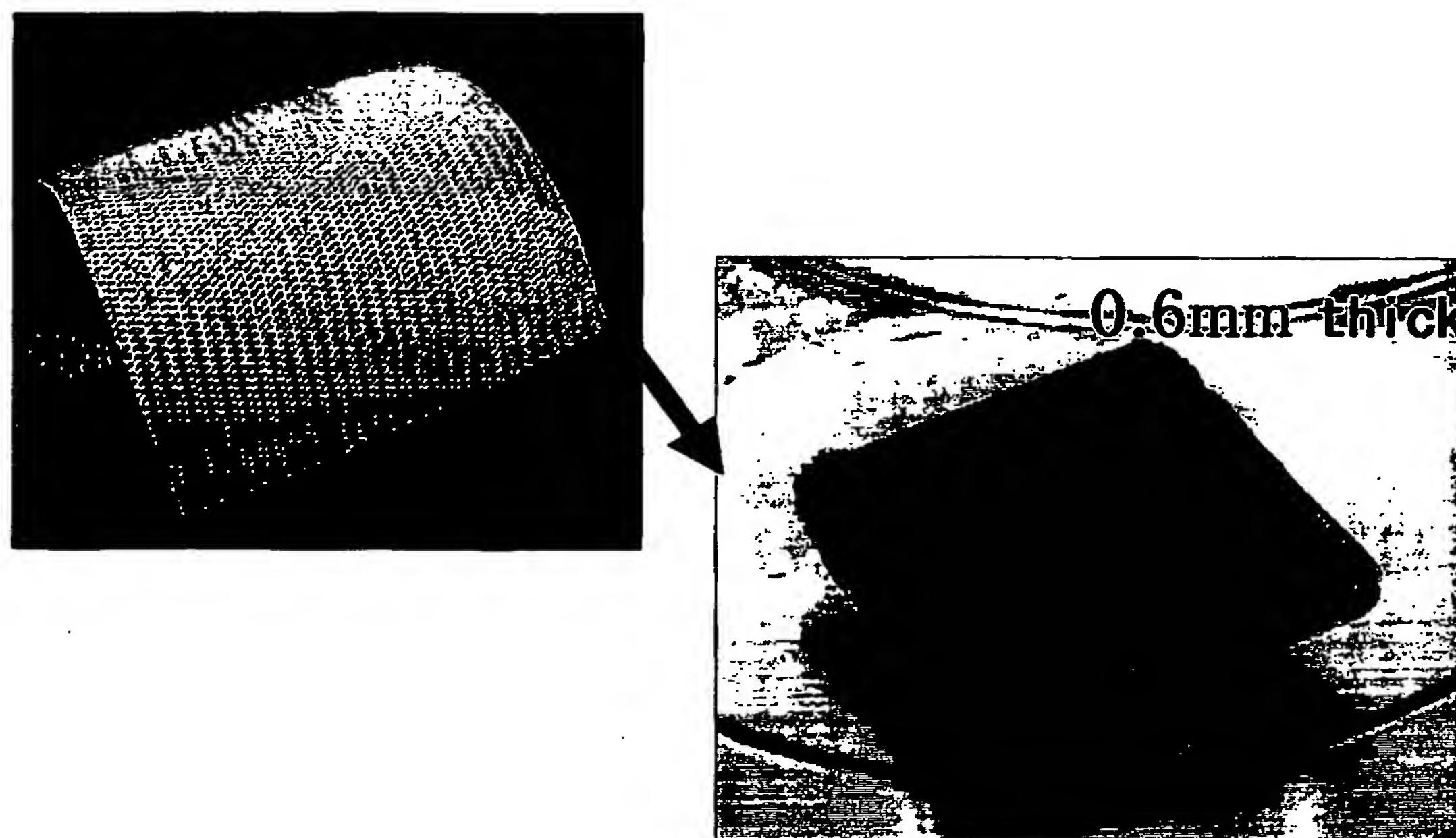


1/64

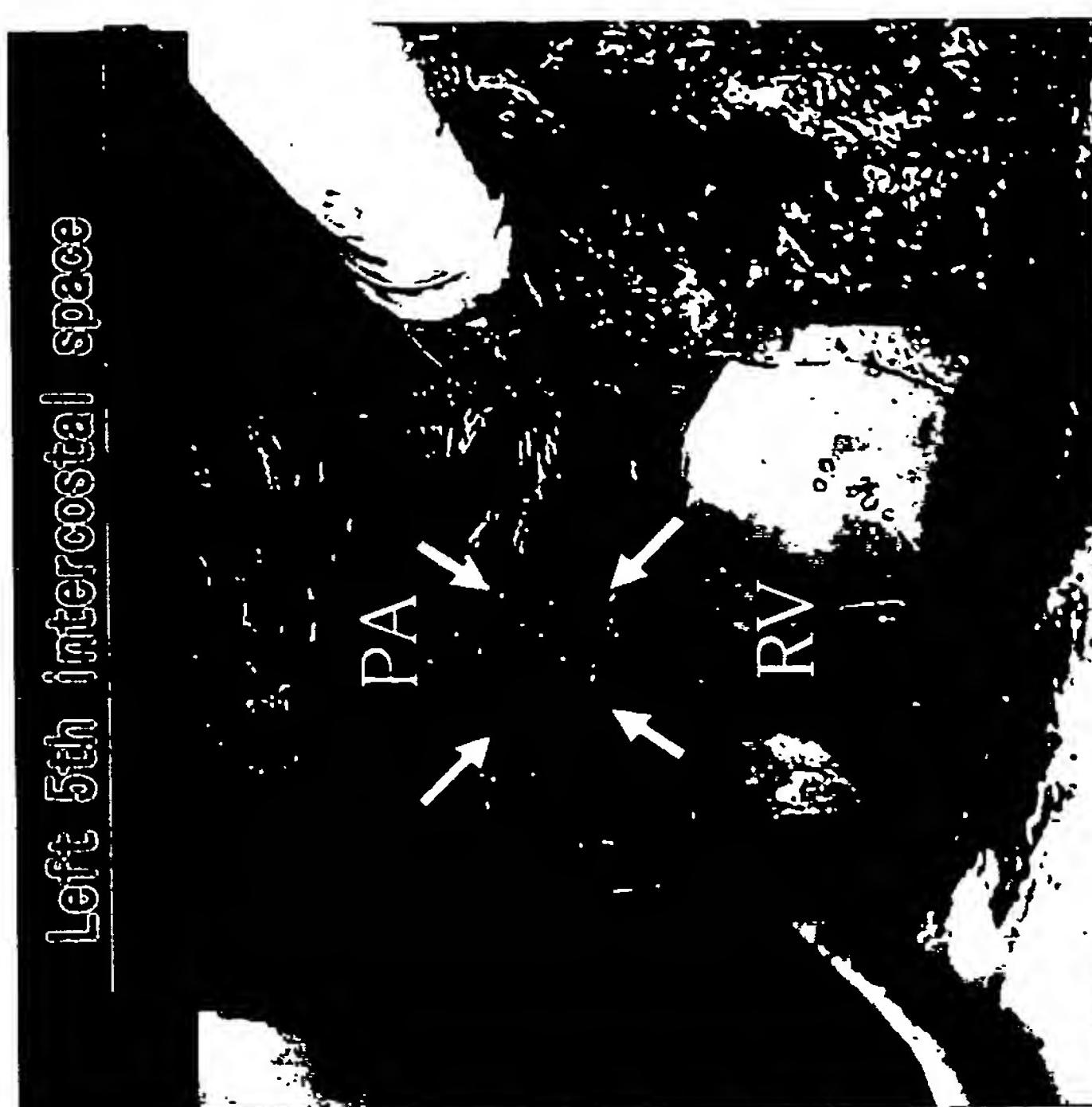
FIG.1



BEST AVAILABLE COPY

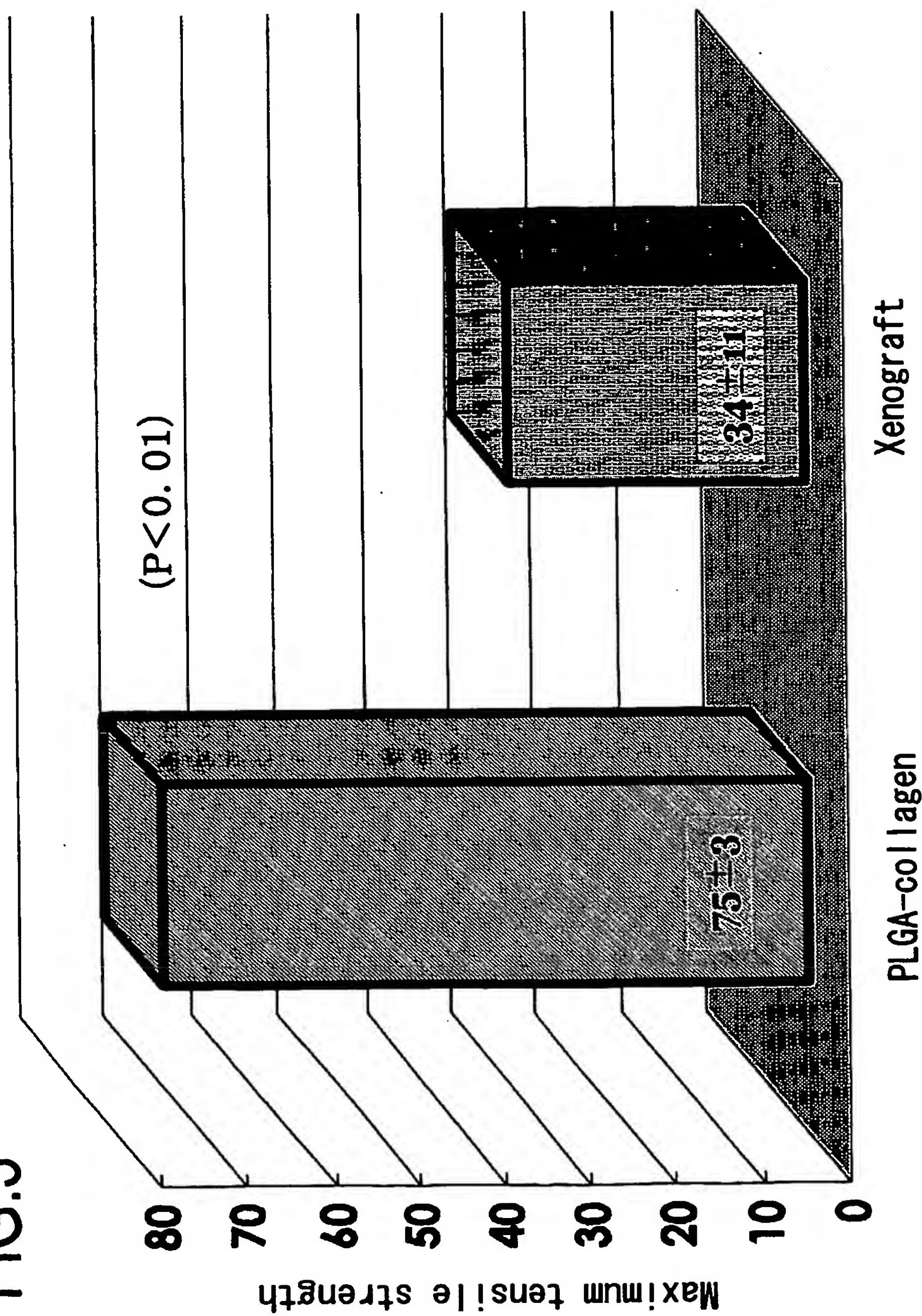
2/64

FIG.2



3/64

FIG.3



<In vitro: cell adhesion efficiency>

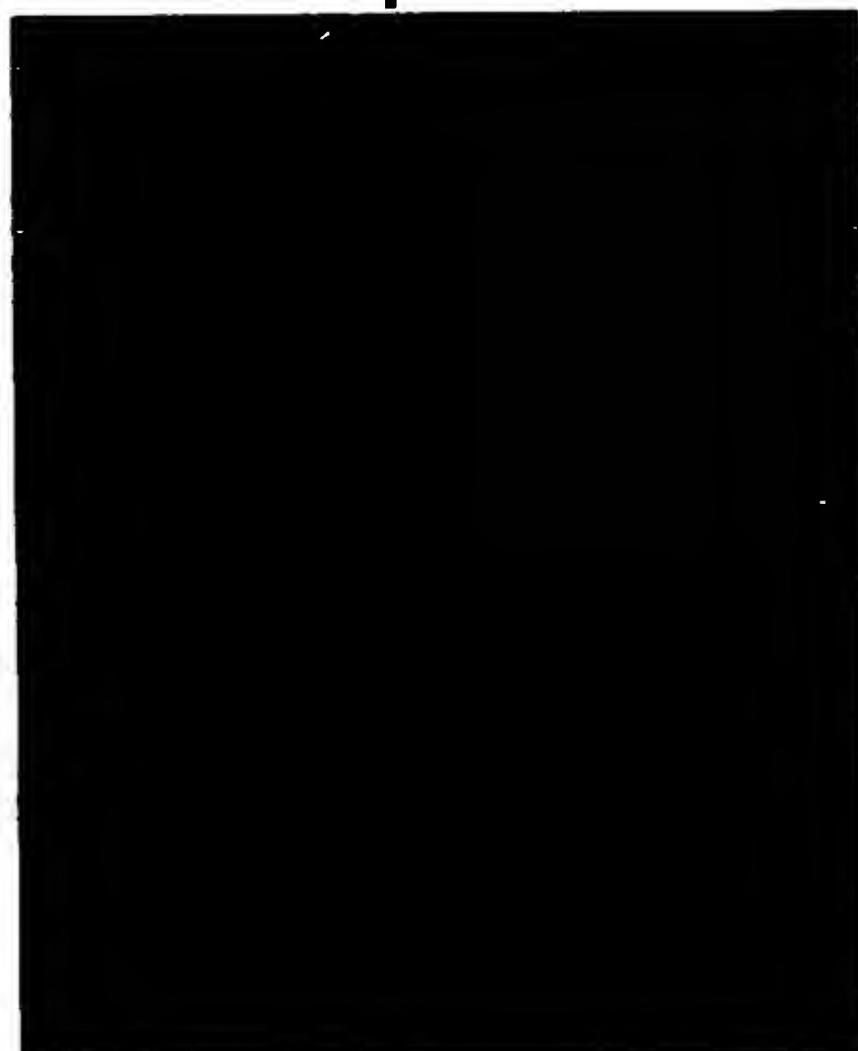
FIG.4

Only collagen type I

VECs seeded

-(P<0.01)-

( 29±10% )



#7 days after cell seeing  
Collagen type I+IV

4/64

VSMCs seeded

-(P<0.01)-

( 40±6% )

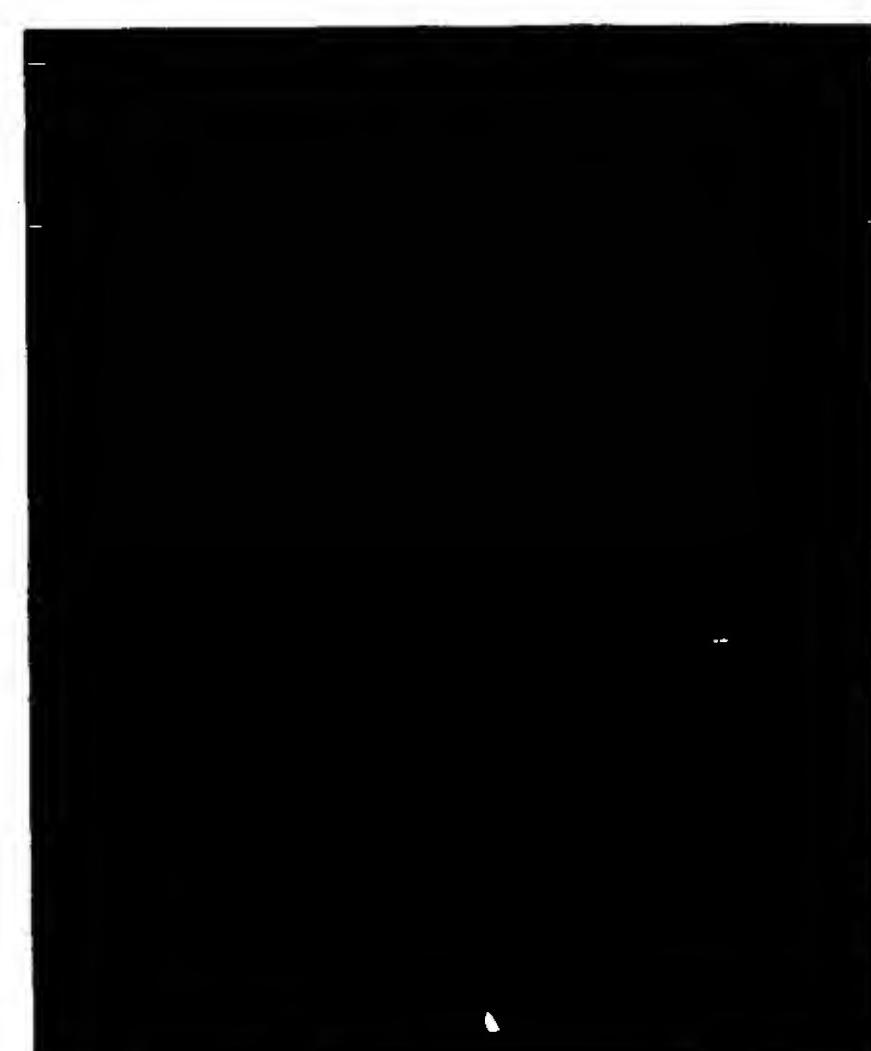
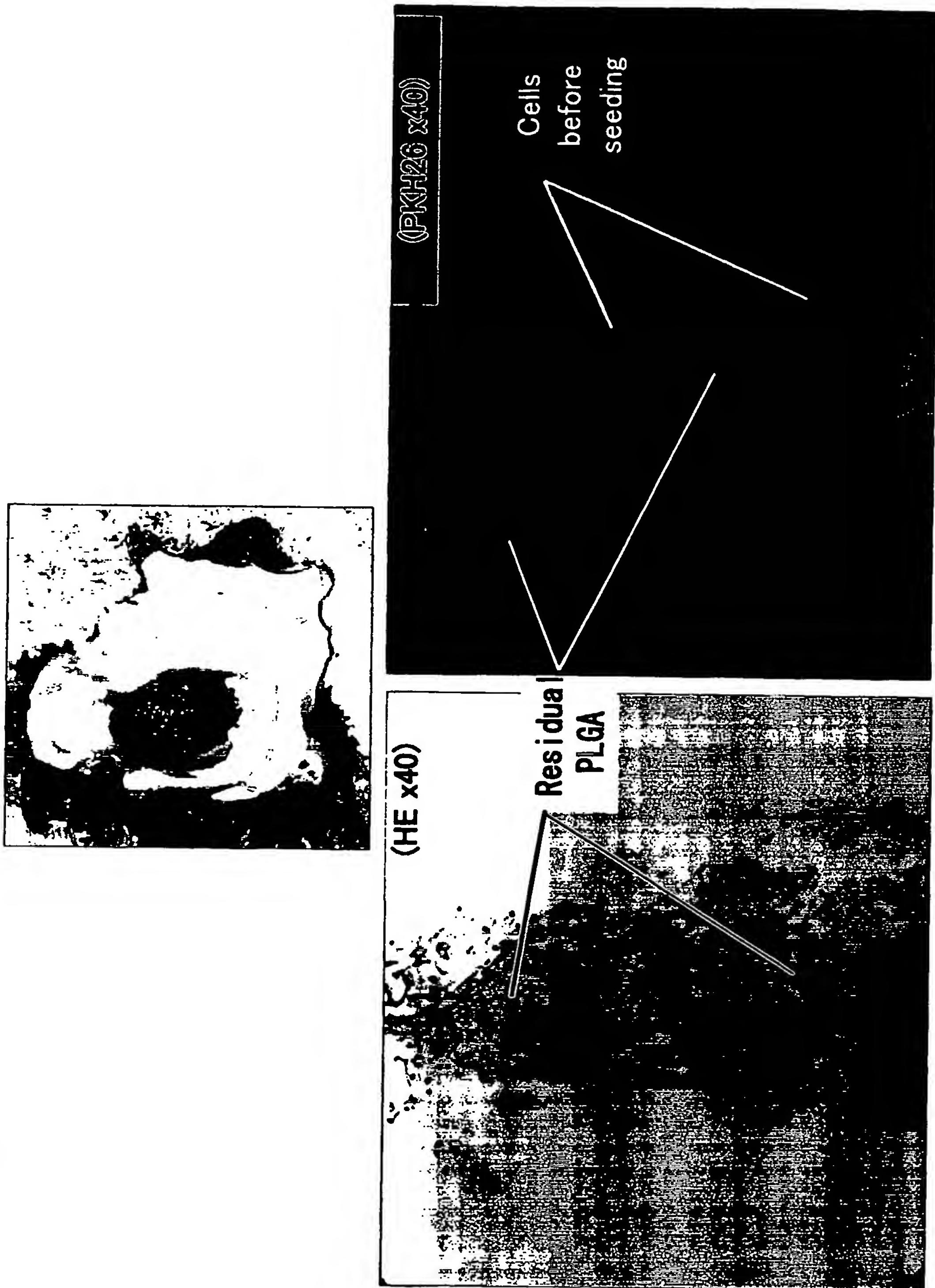


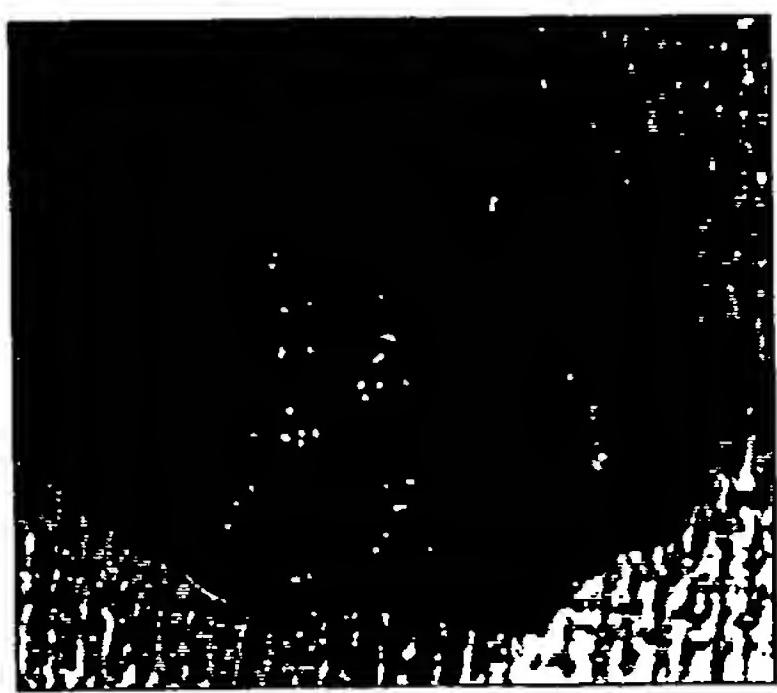
FIG.5 (In vivo: two months after implantation)



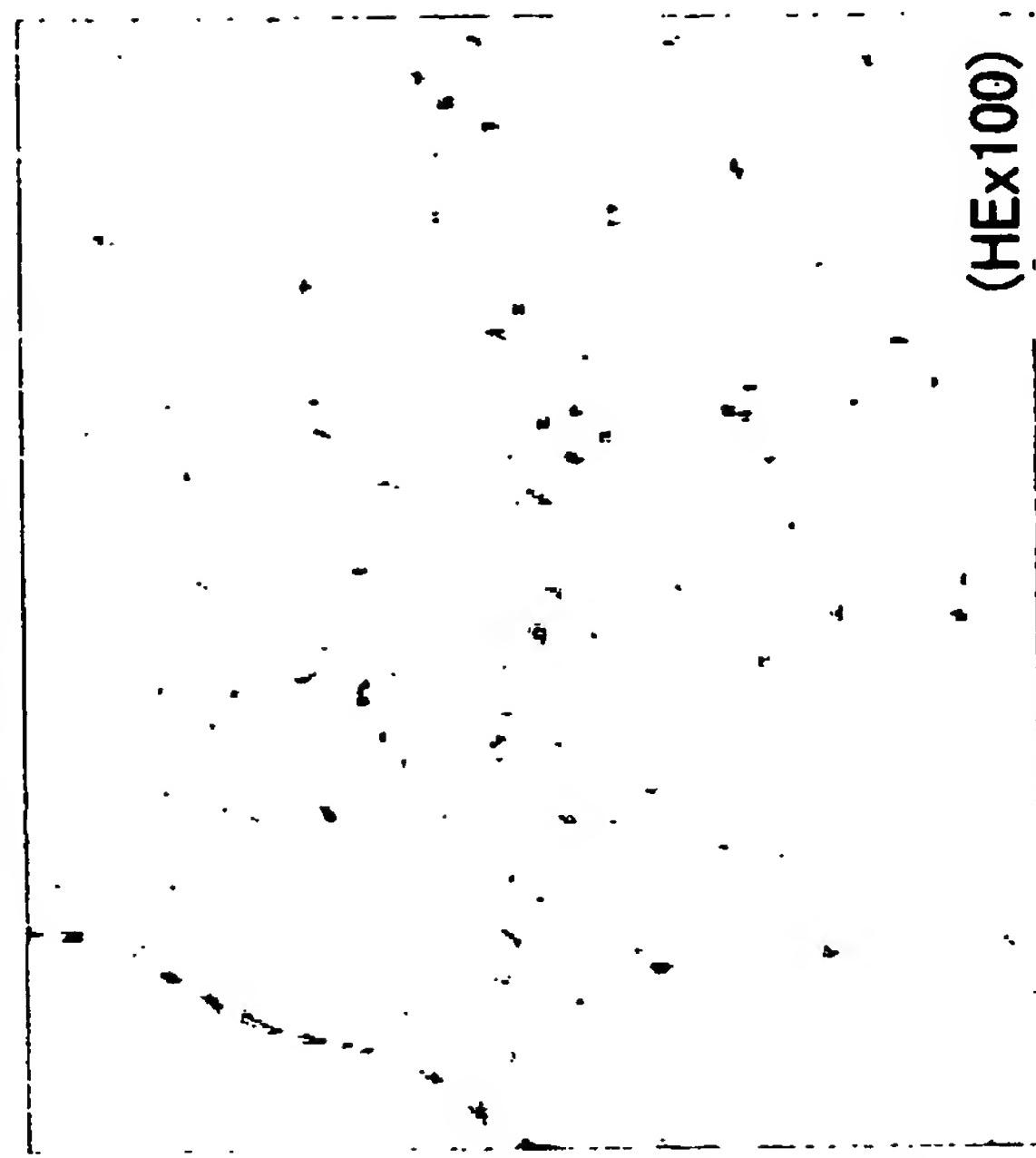
6/64

**FIG.6** (In vivo: two months after implantation)

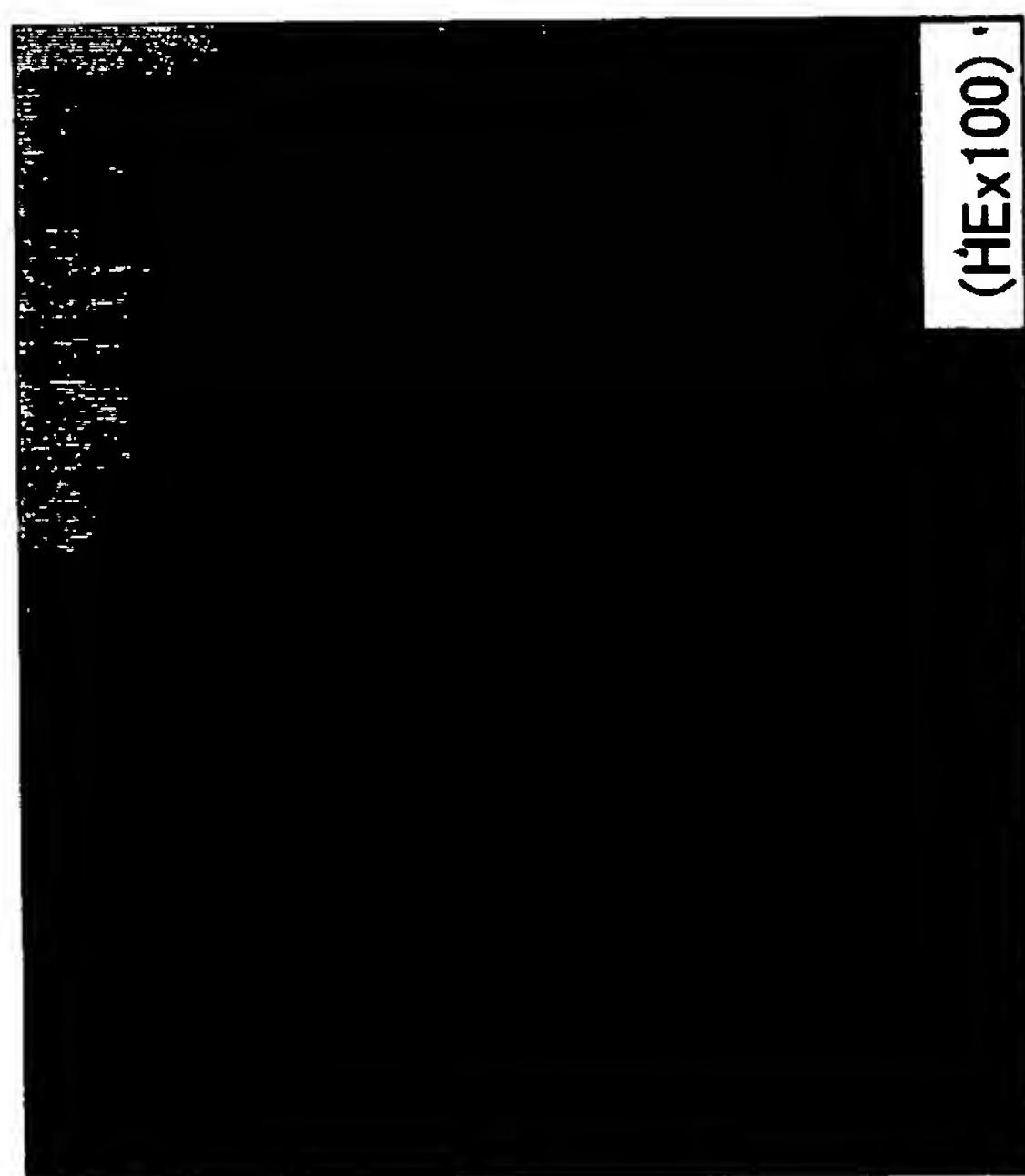
Smooth internal side  
Attached thrombi (-)



Cells seeded (-)



Cells seeded (+)



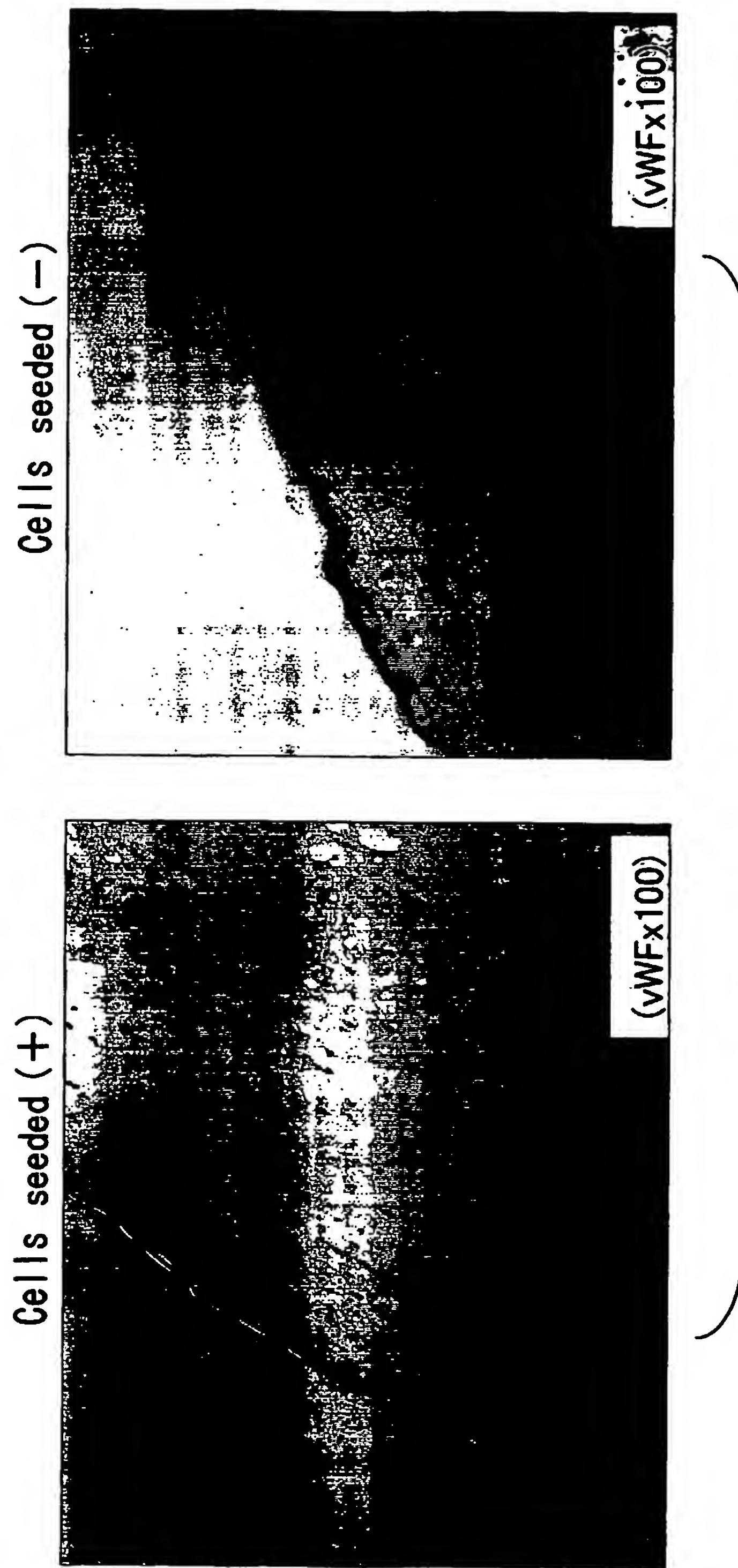
(HEx100)

(HEx100)

7/64

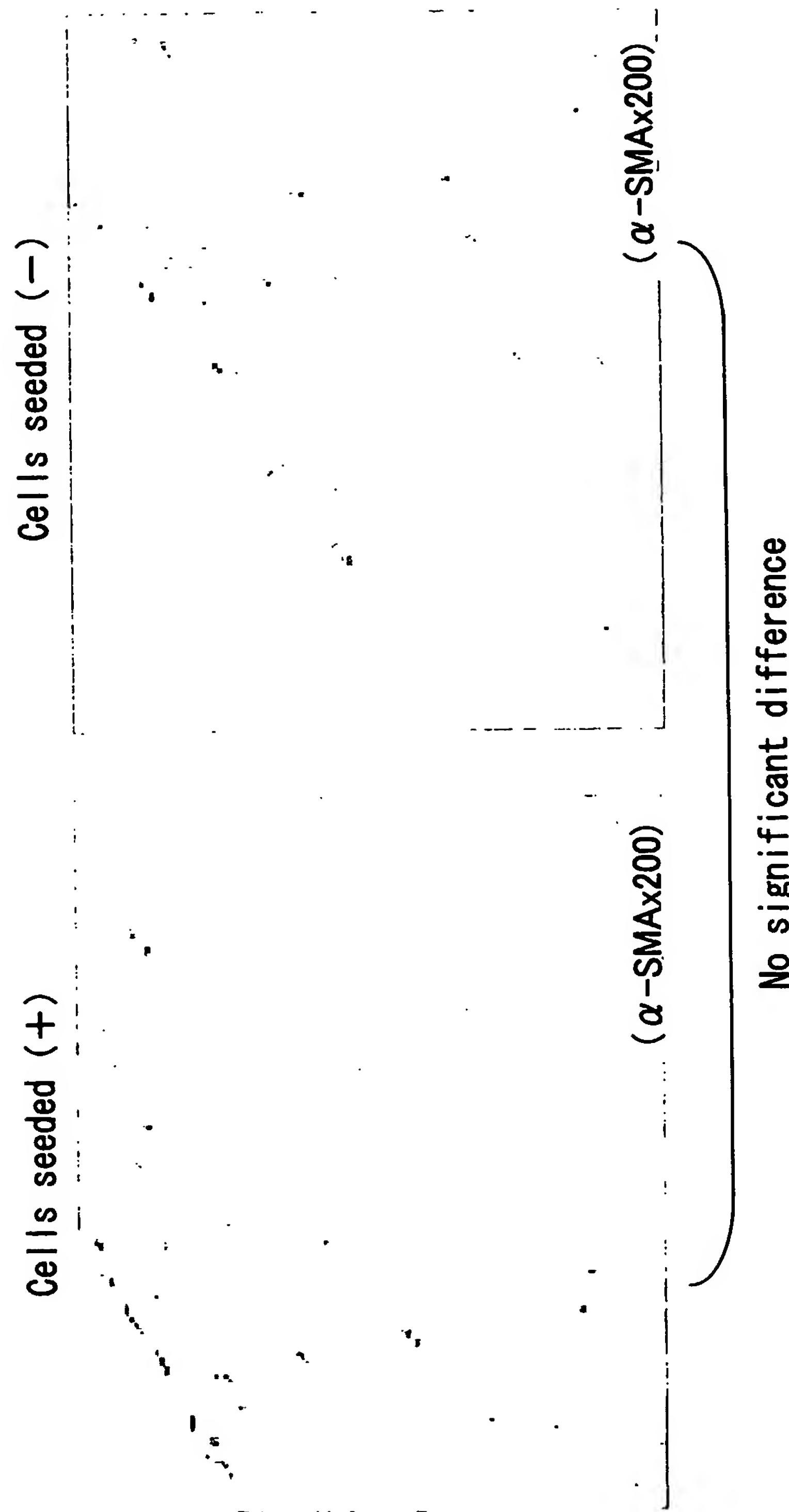
# FIG.7

(*In vivo*: two months after implantation; vascular endothelial cell)



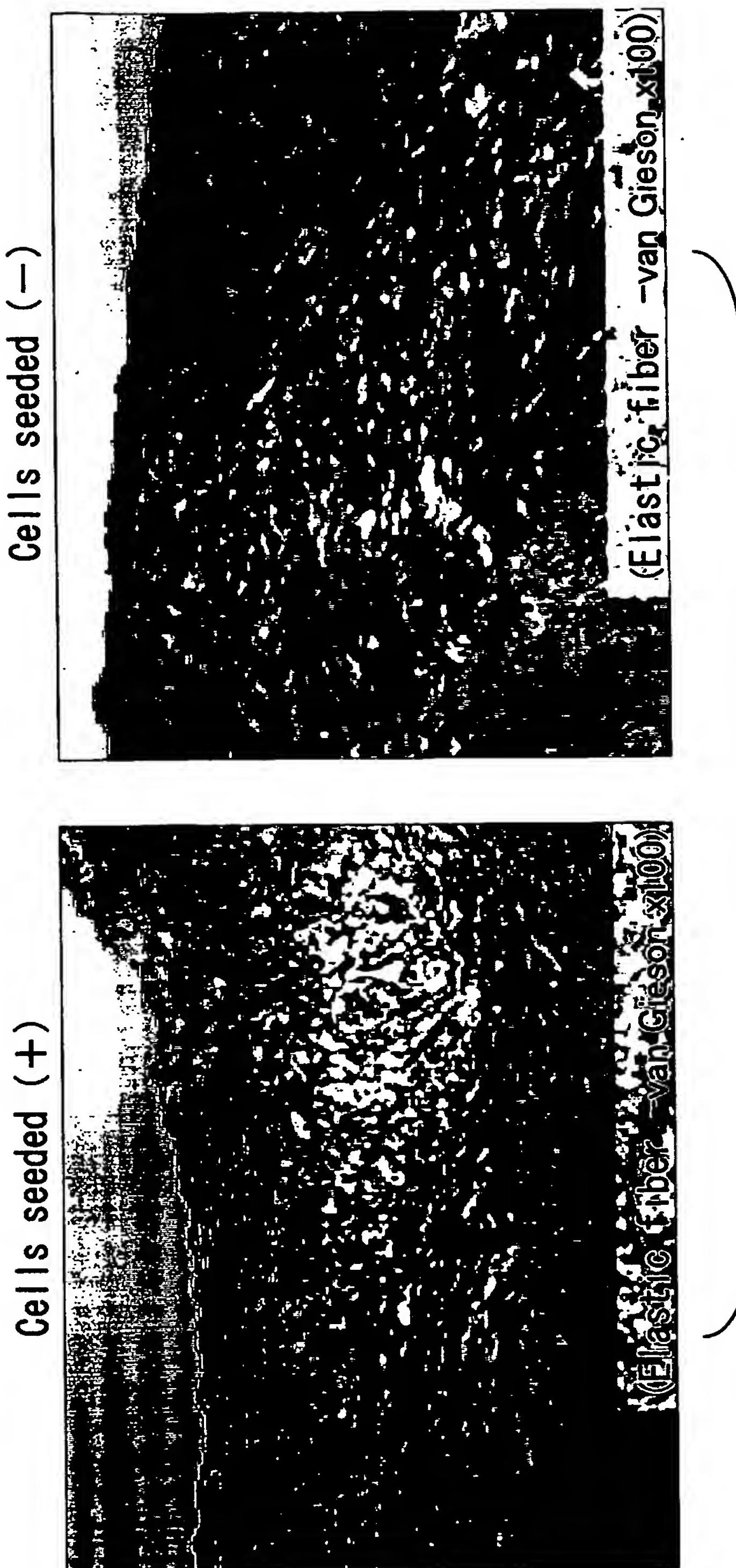
8/64

**FIG.8**  
**(In vivo: two months after implantation; vascular smooth muscle cell)**



9/64

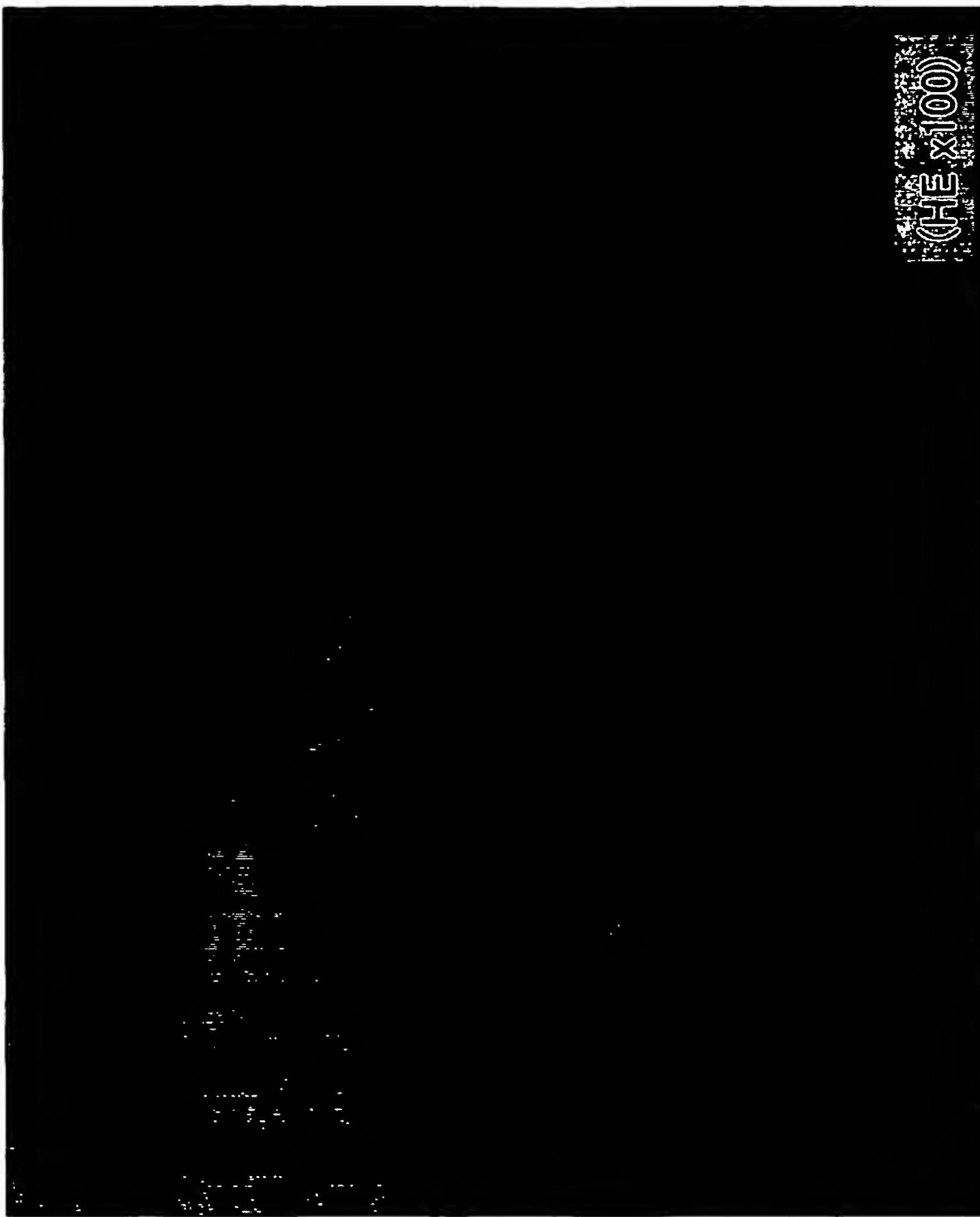
**FIG.9**  
**(In vivo: two months after implantation; elastic fiber)**



10/64

**FIG.10** (In vivo: six months after implantation)

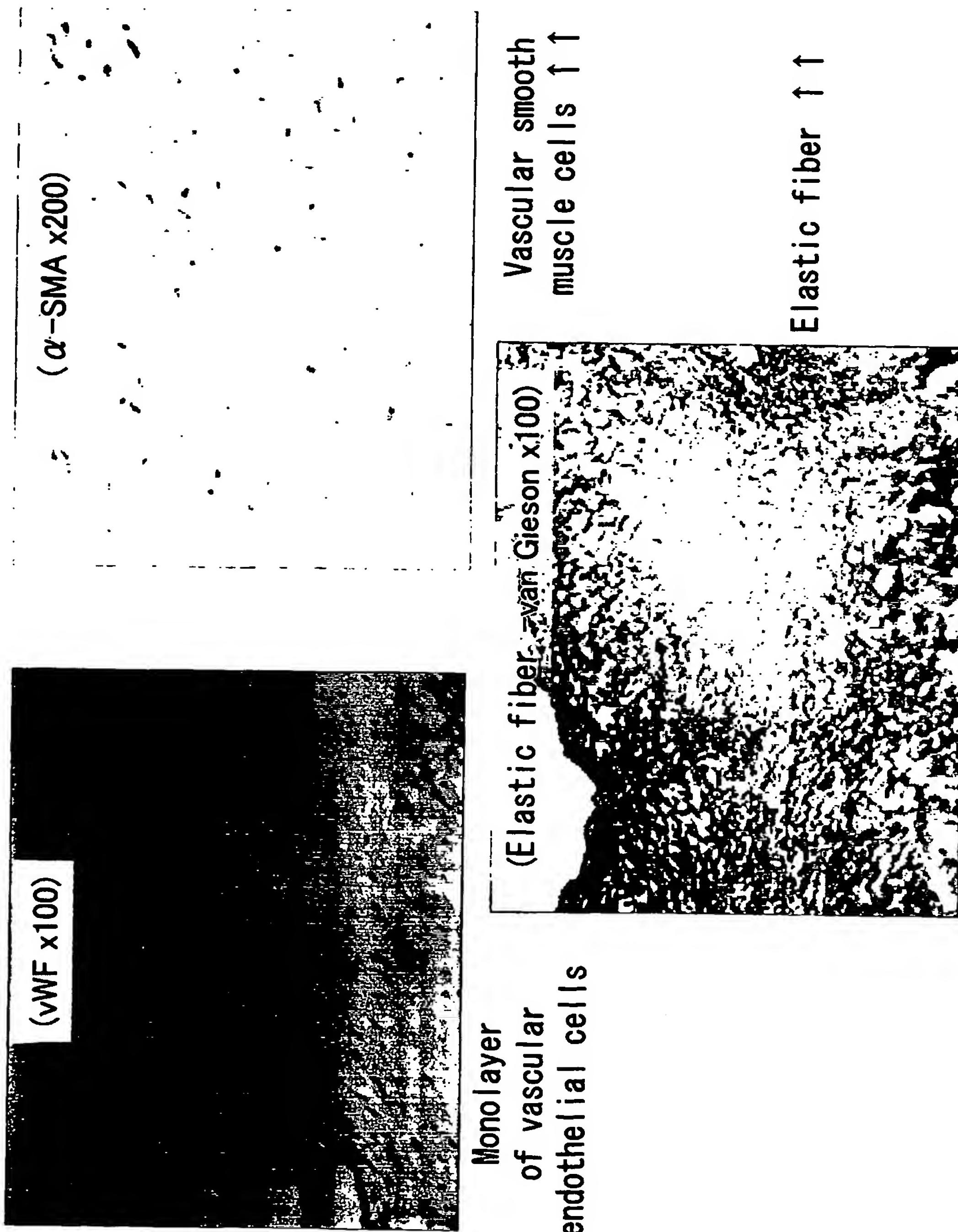
Cells seeded (-)



Smooth internal side  
Attached thrombi (-)

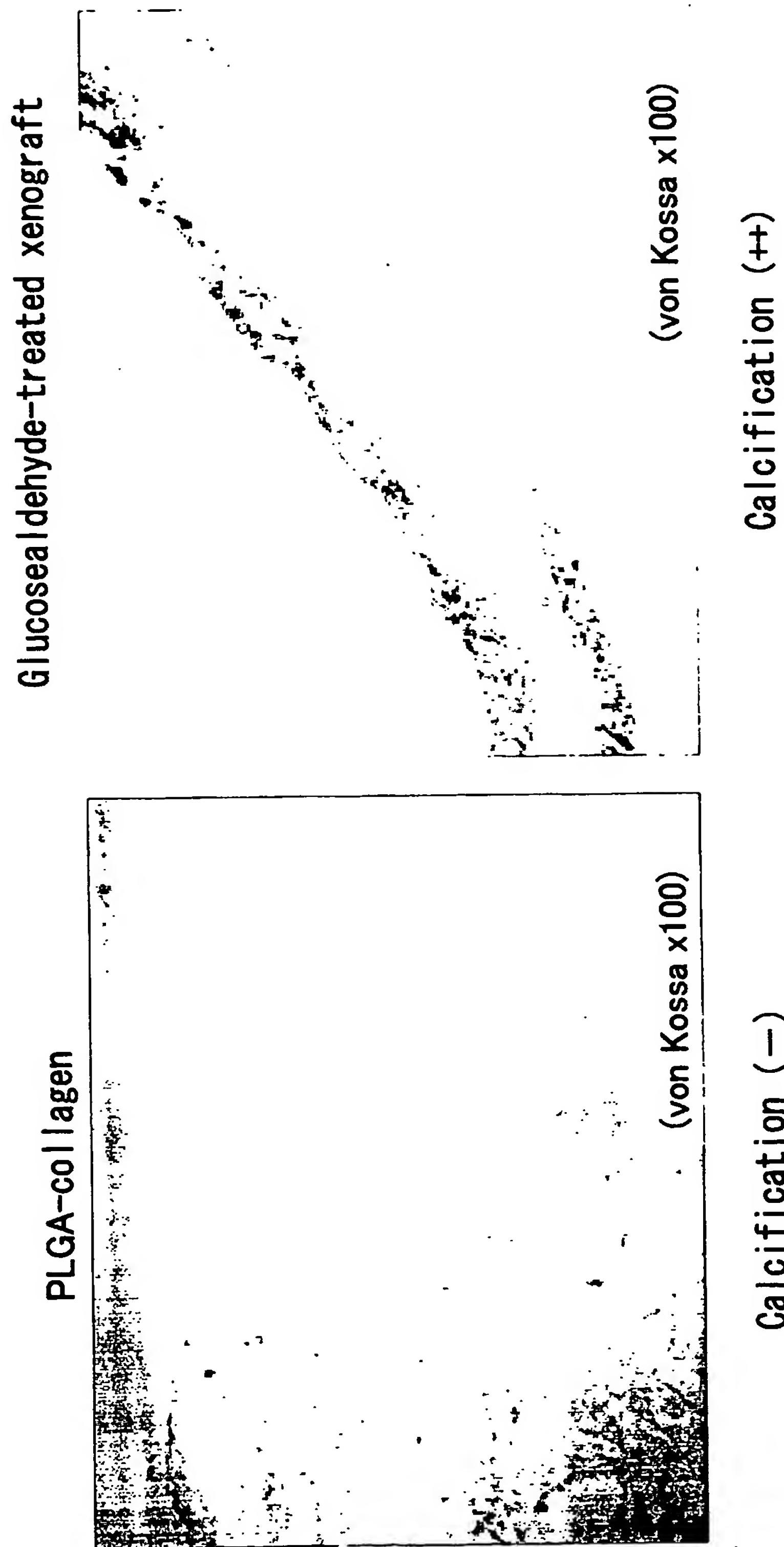


**FIG.11** (In vivo: six months after implantation)



12/64

**FIG.12**  
**(In vivo: six months after implantation; calcification)**



13/64

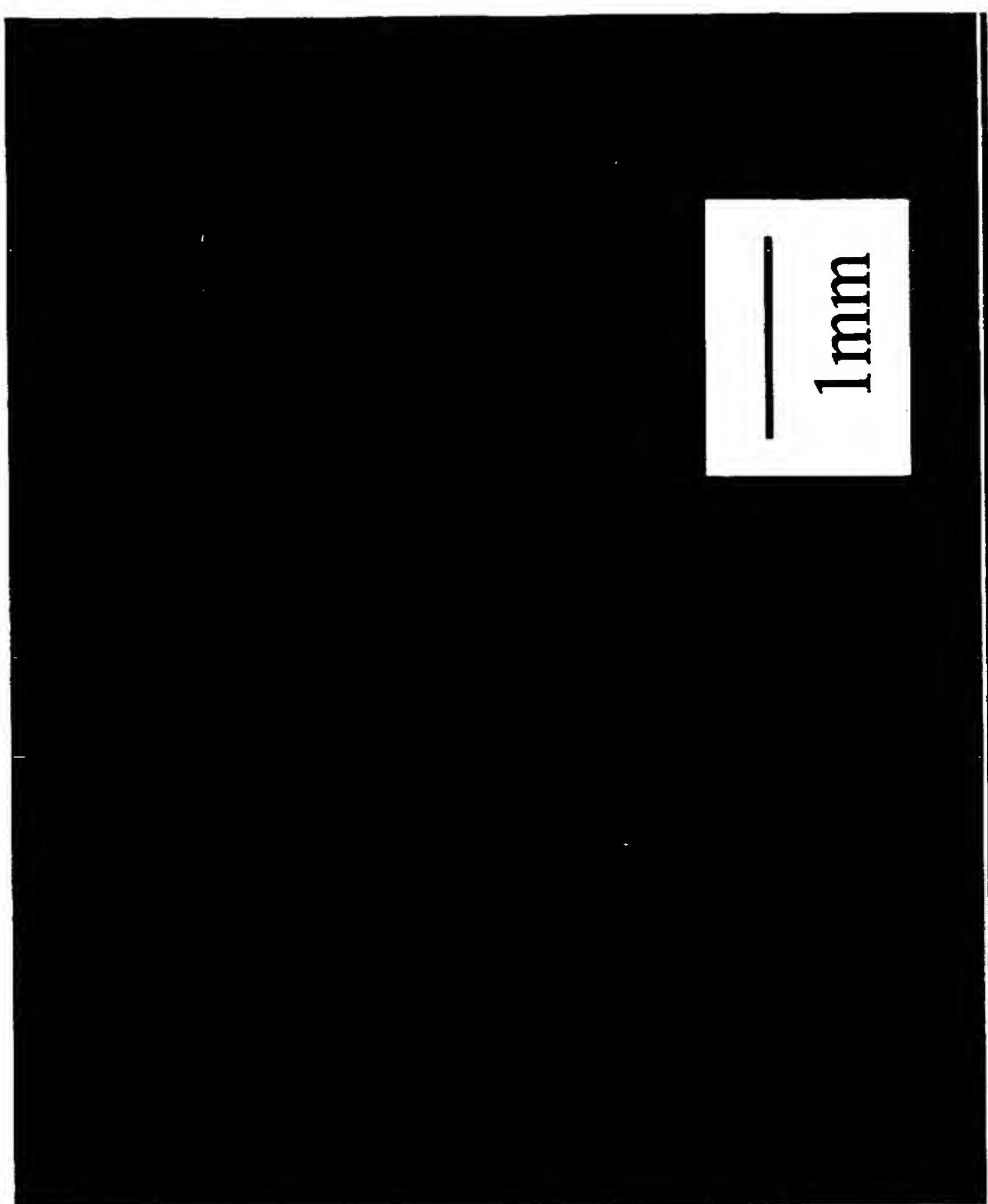


FIG. 13A

14/64

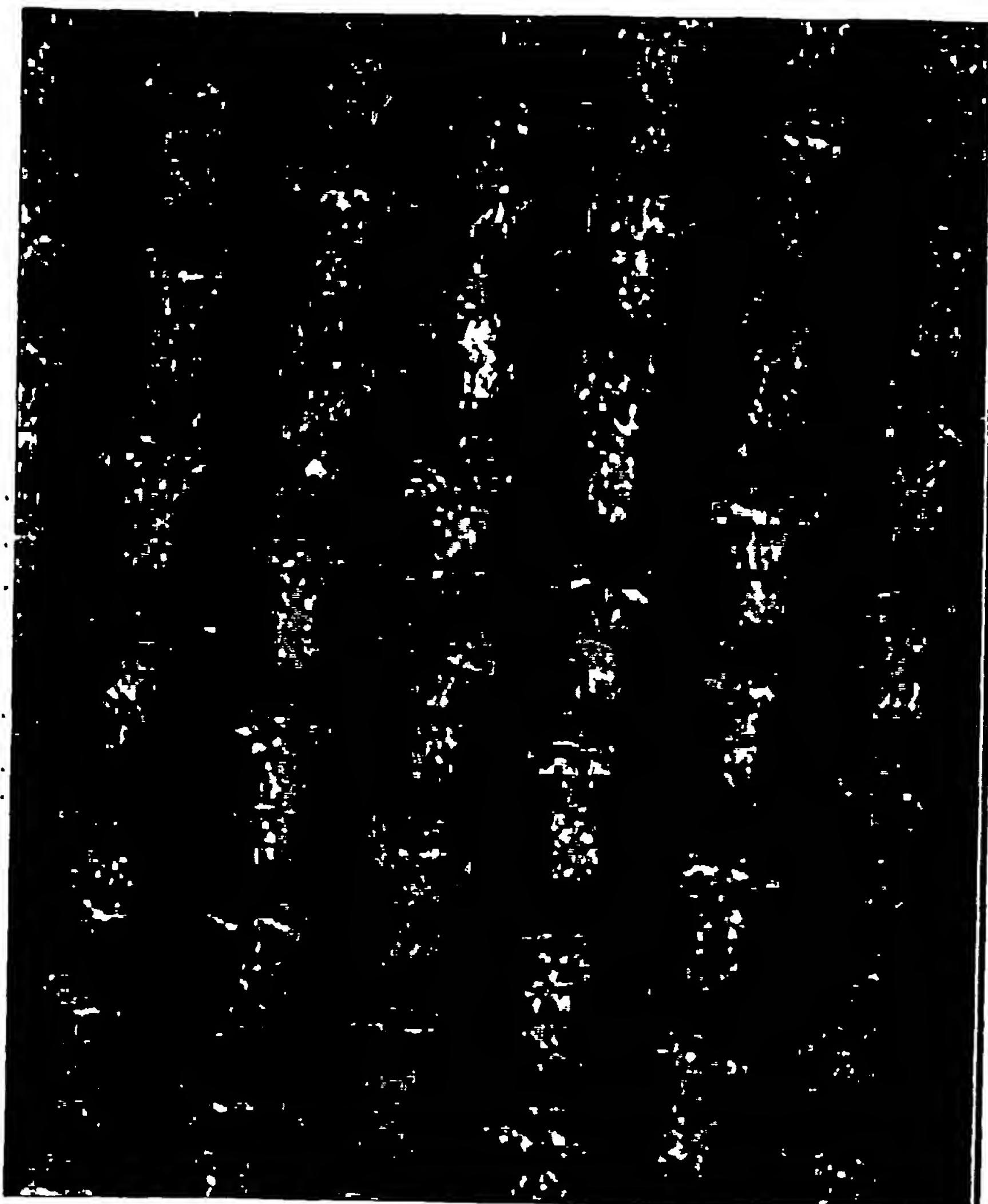


FIG.13B

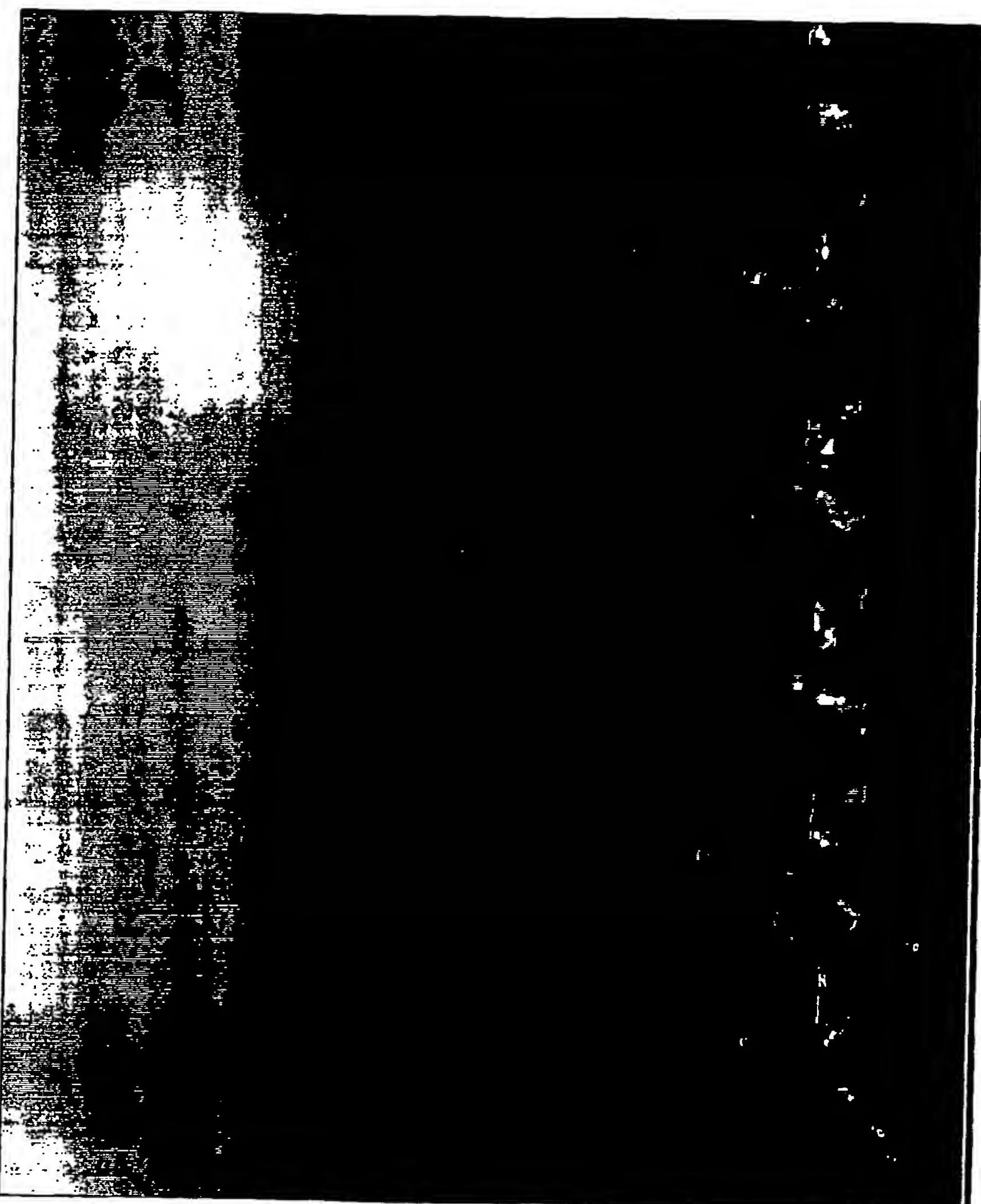
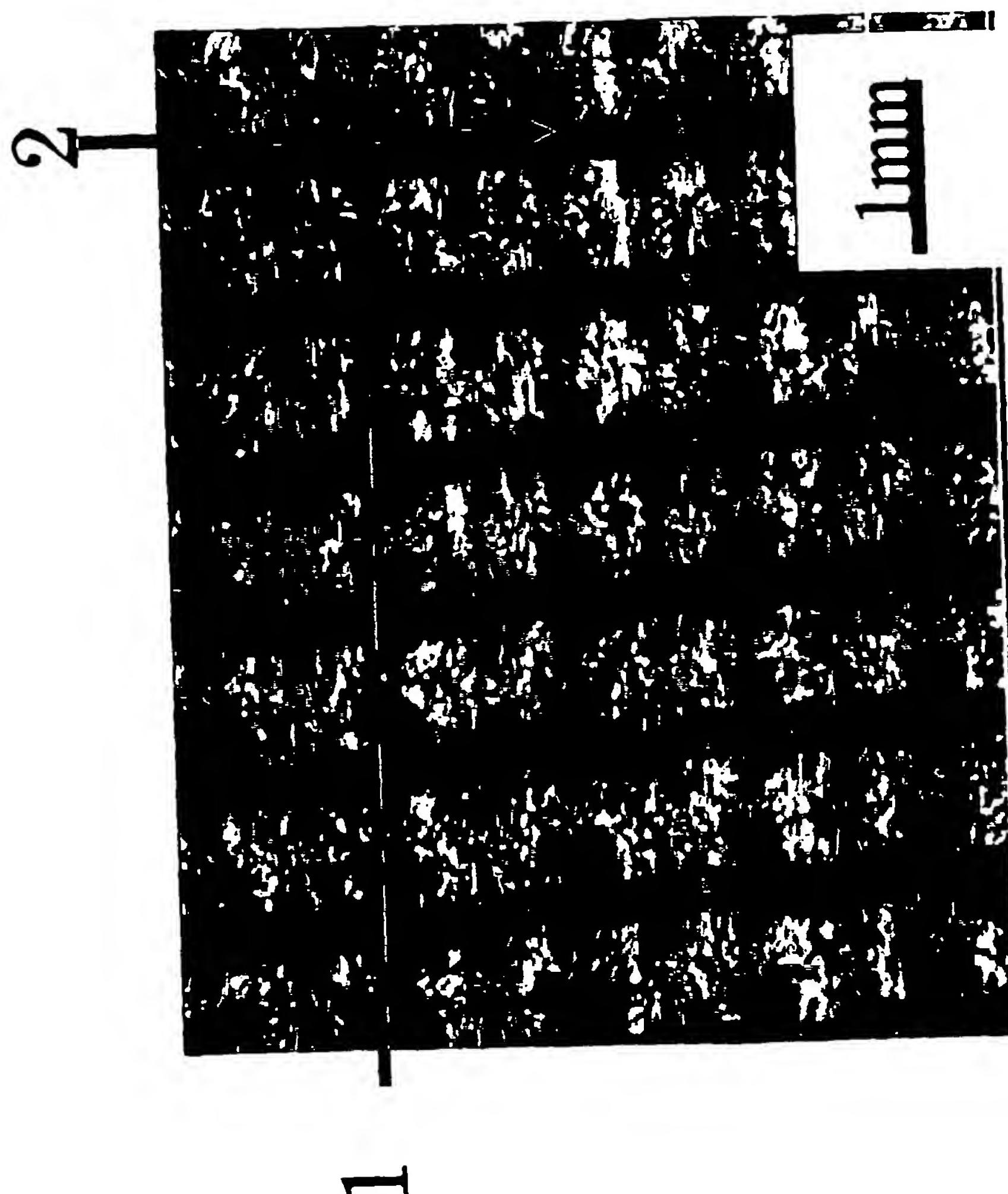


FIG. 14

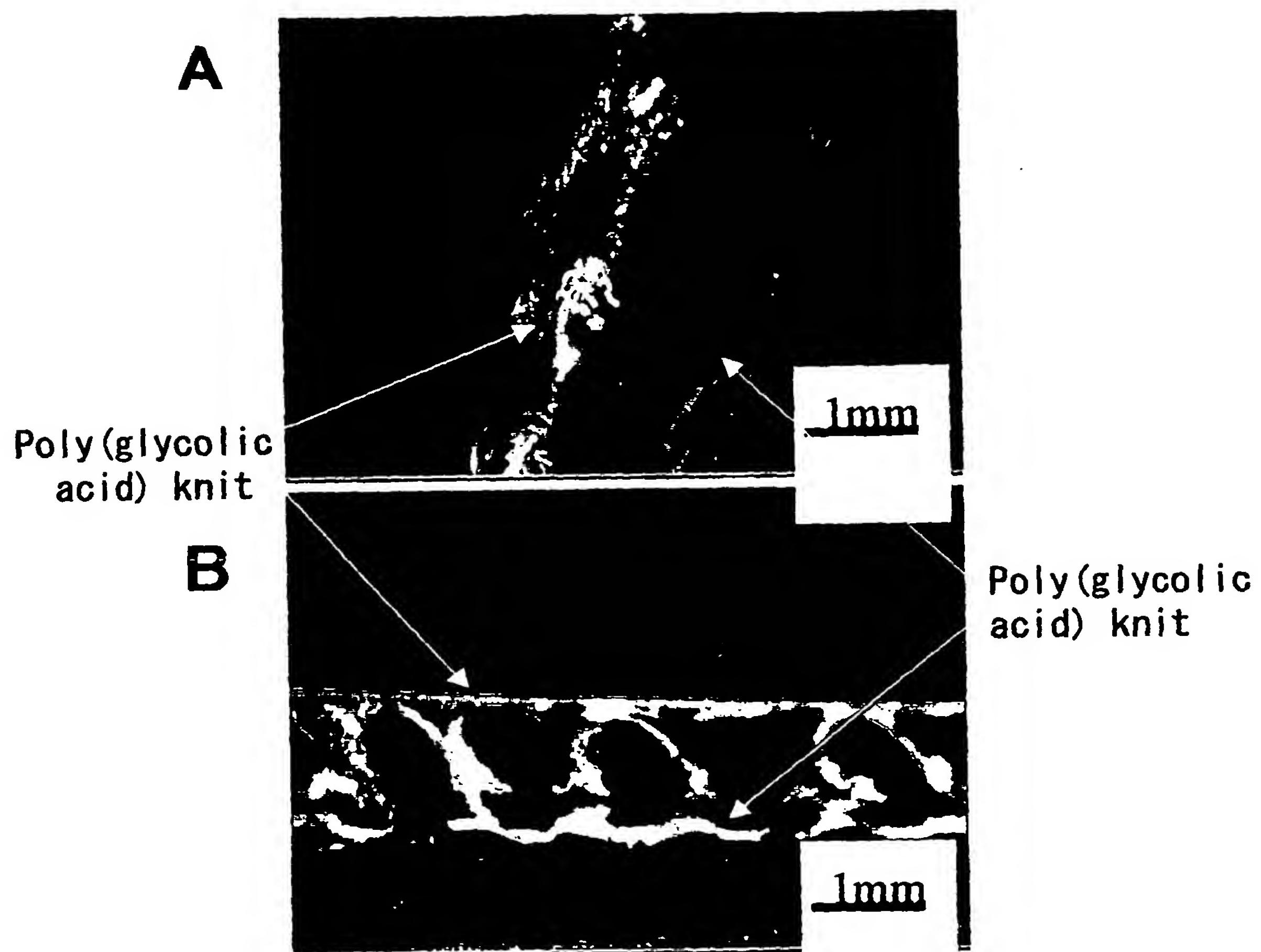
16/64



1

FIG.15

17/64

**FIG.16A**

18/64

FIG. 16B

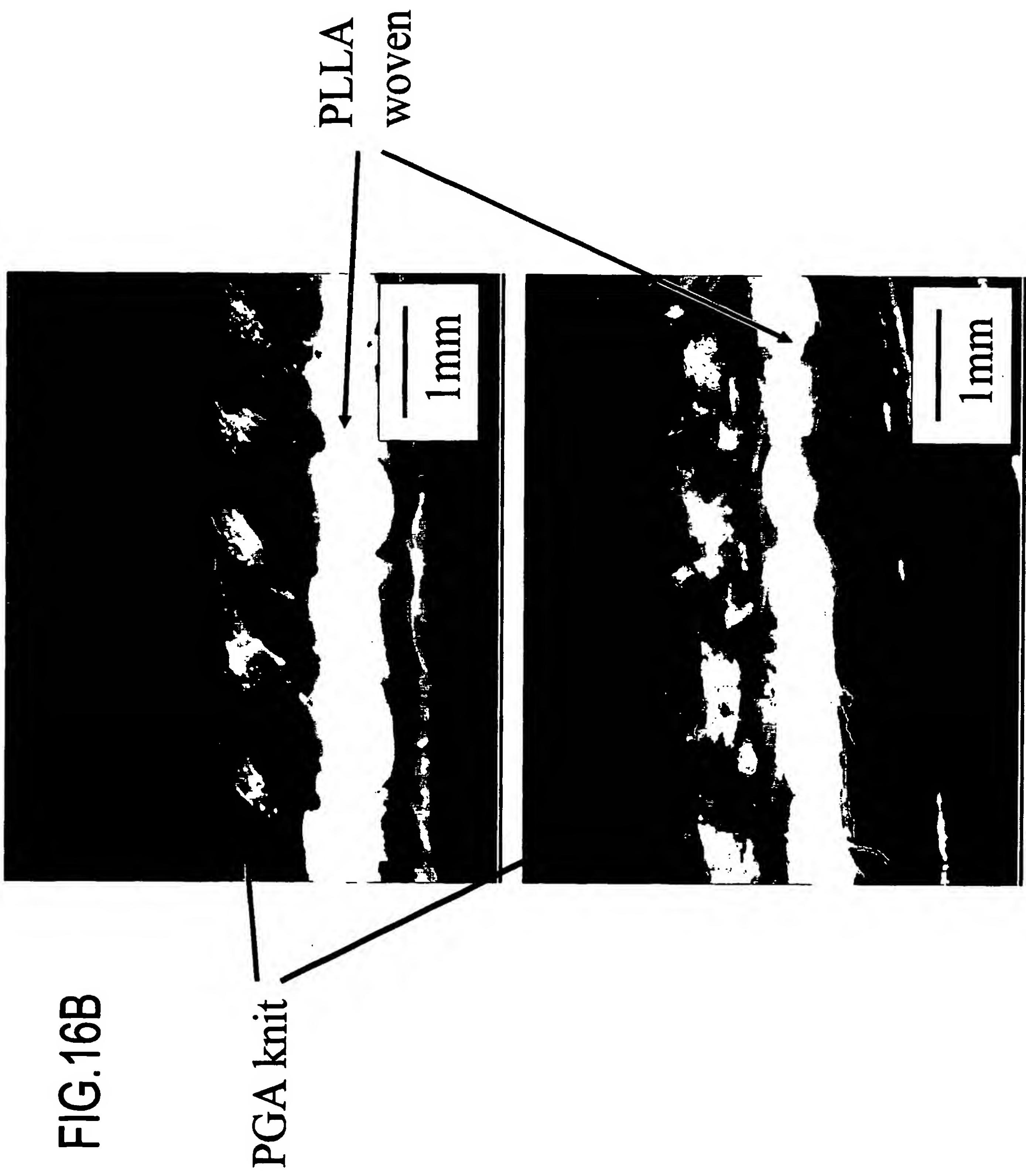
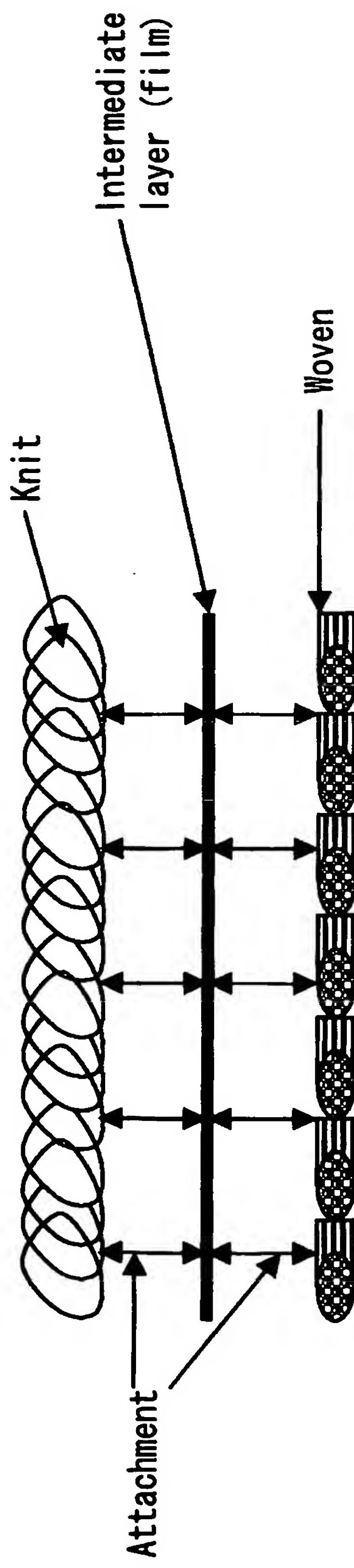
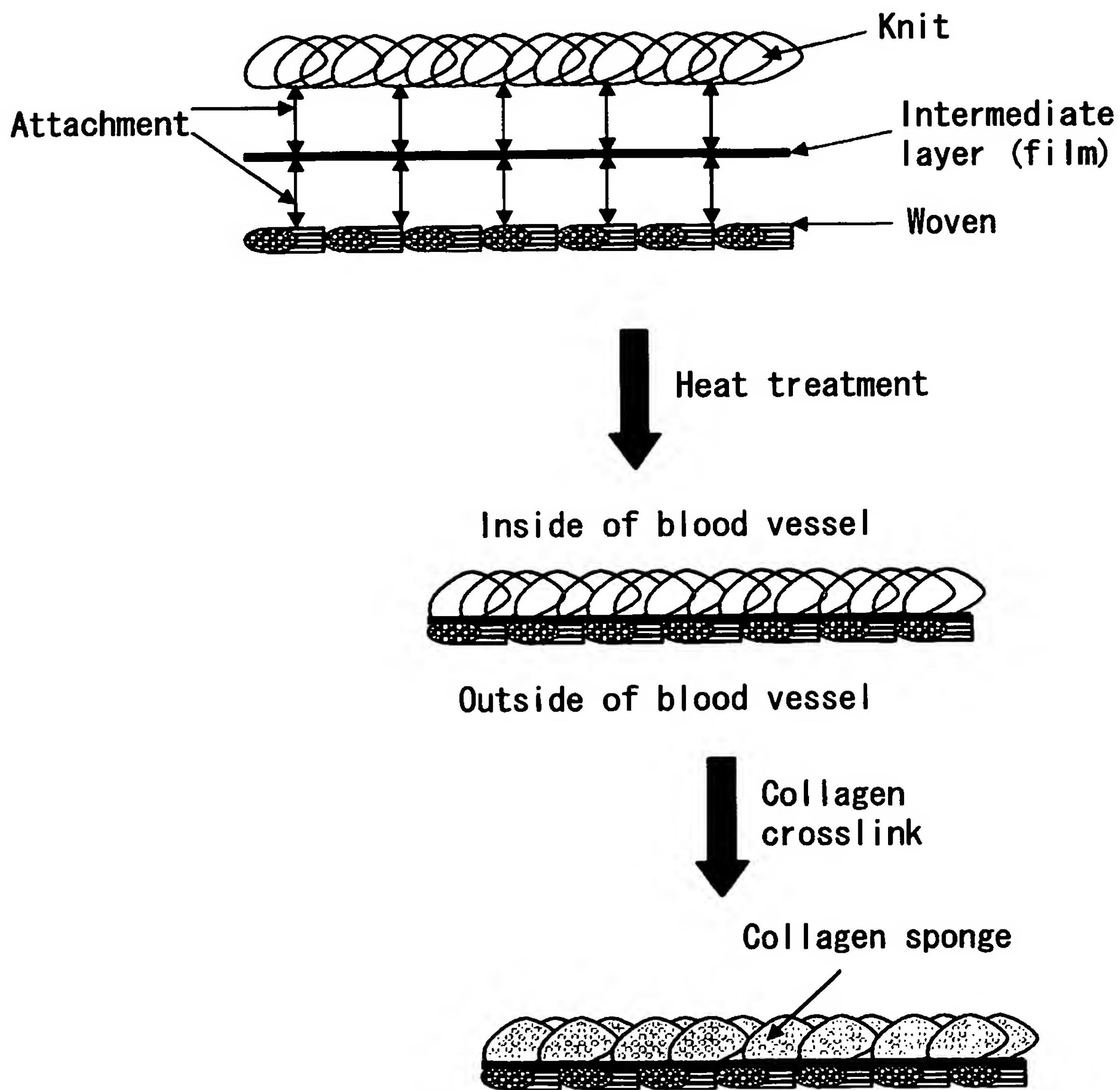


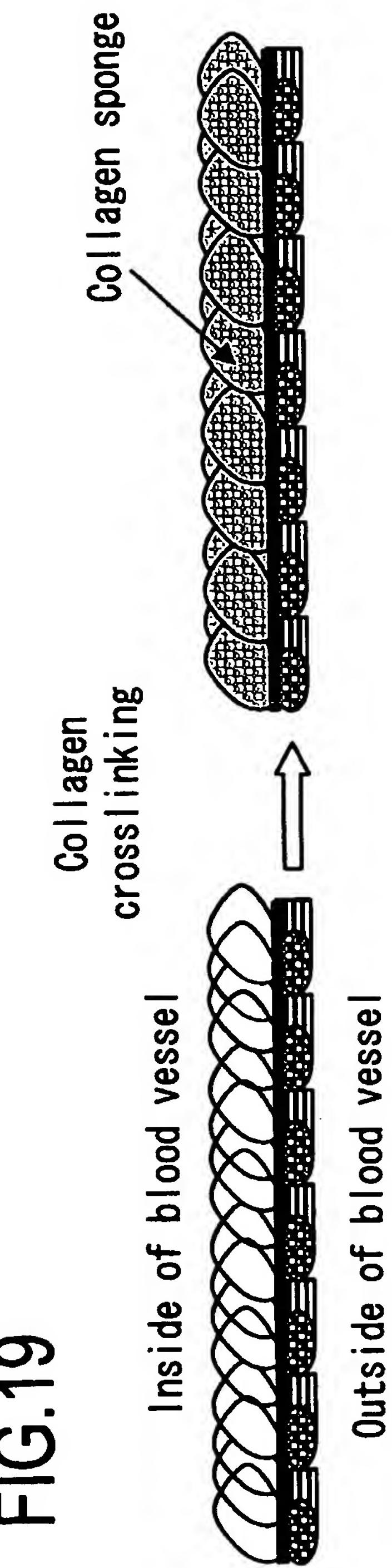
FIG.17



## FIG.18 Patch production method



21/64



22/64

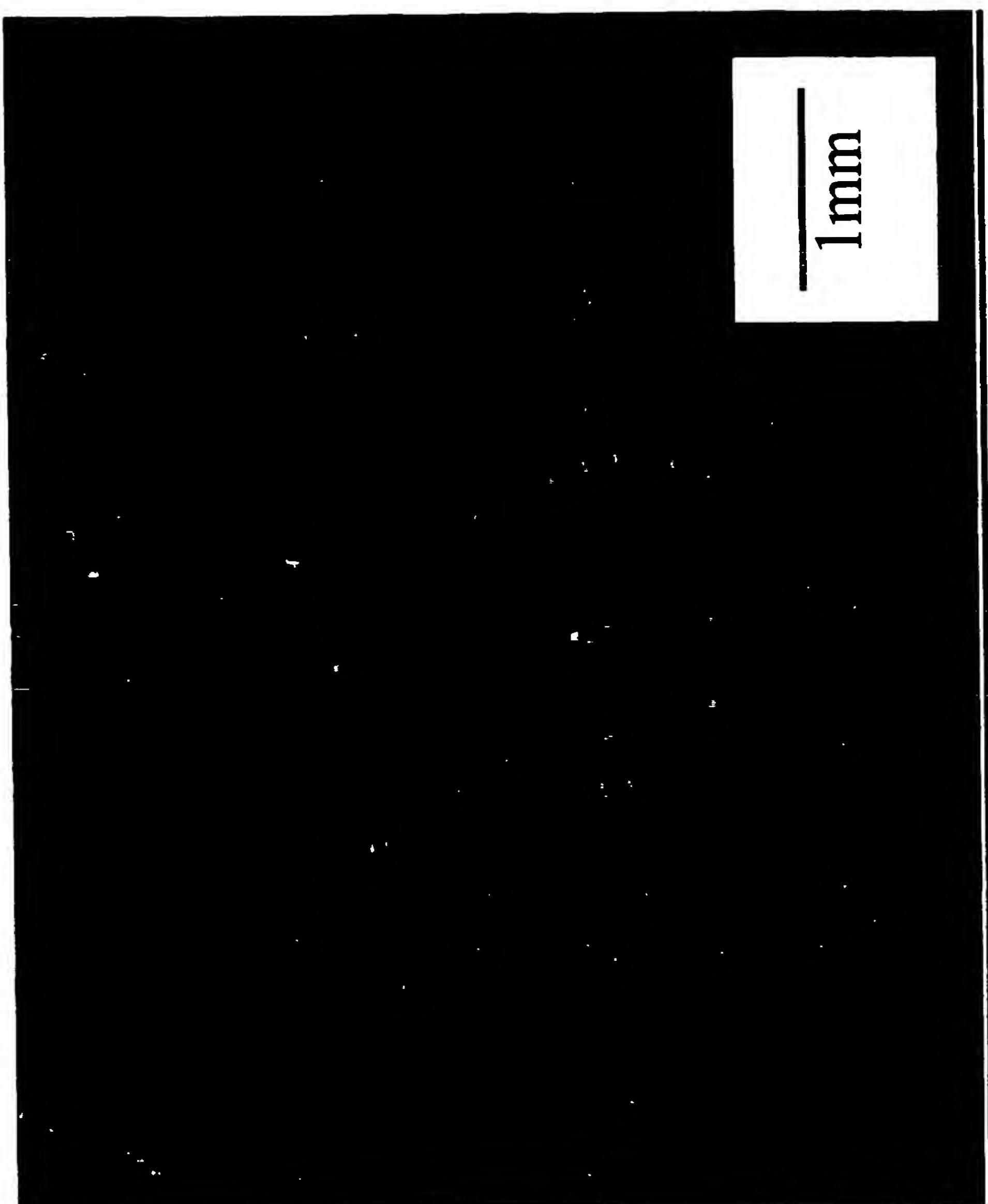
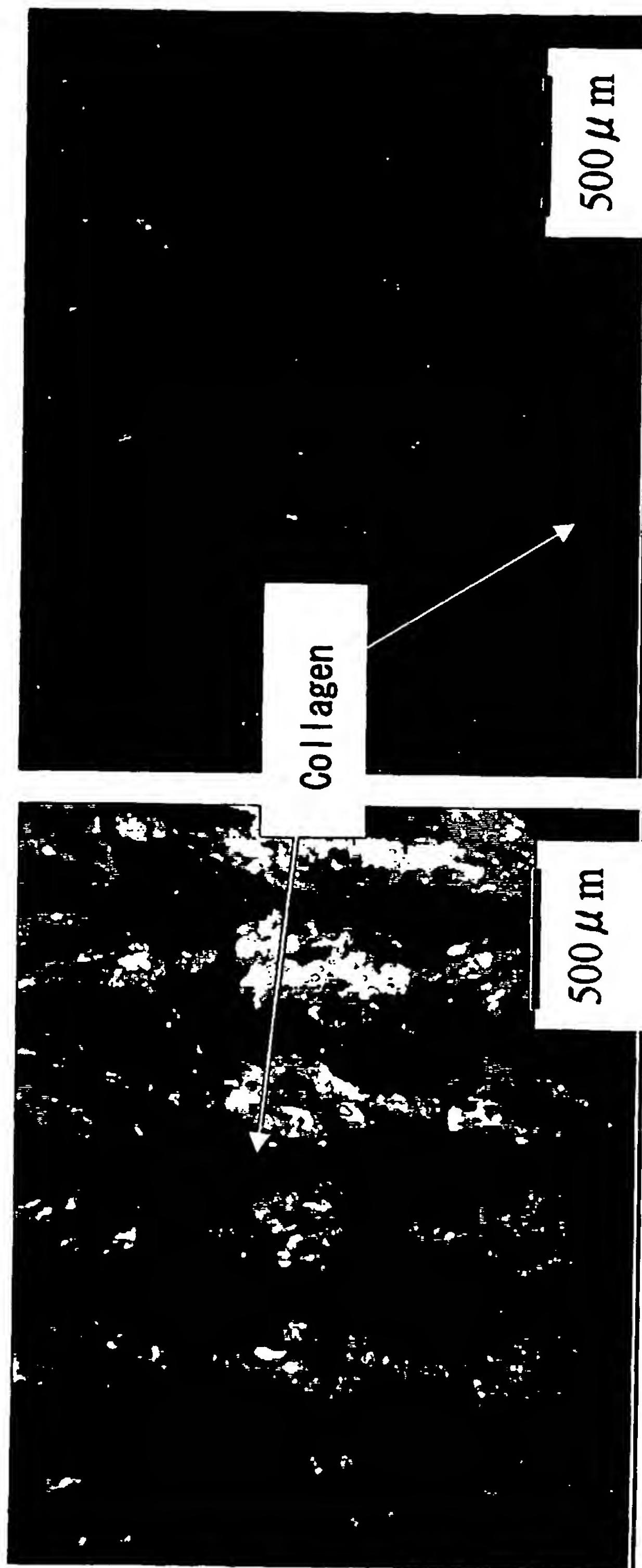
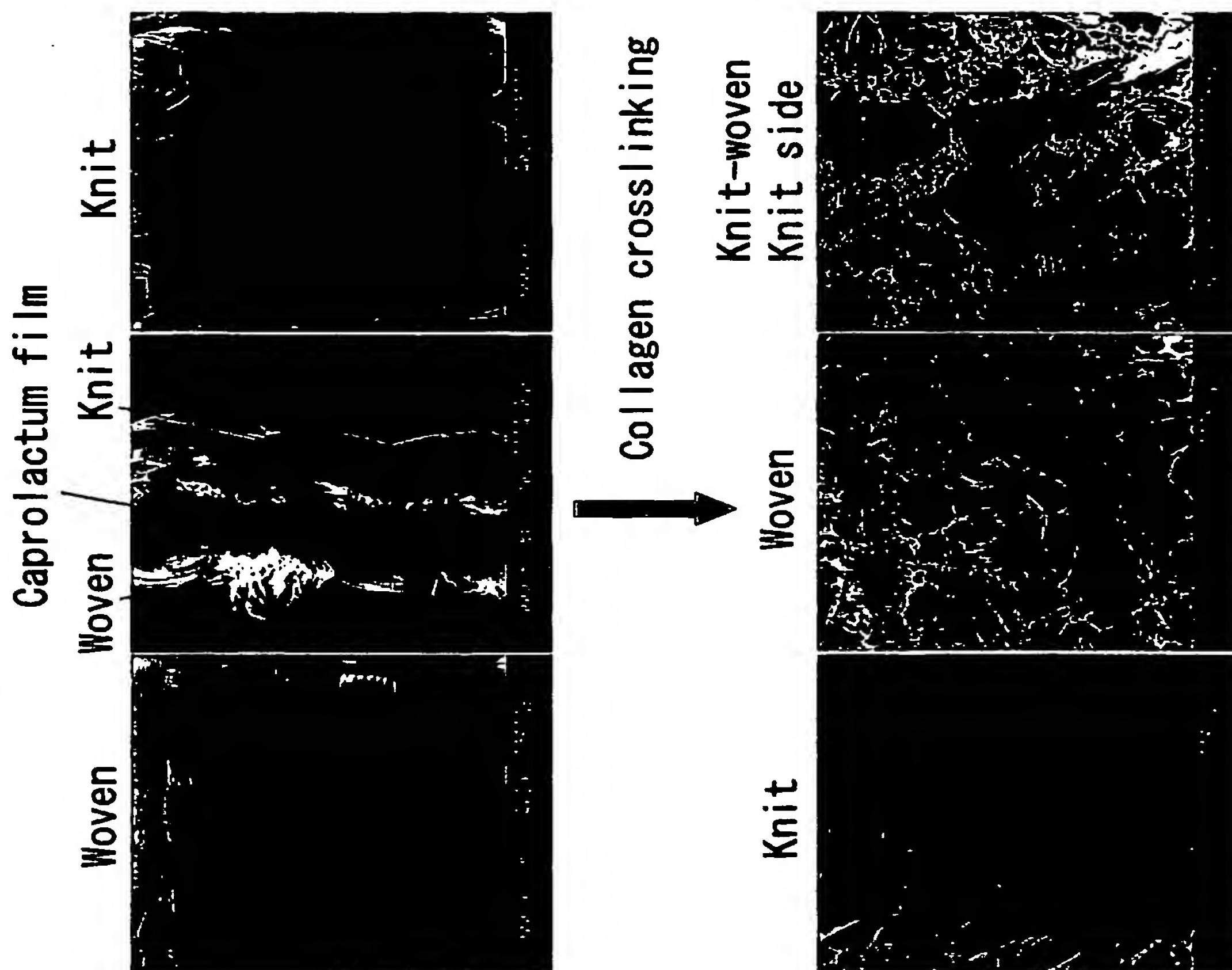


FIG.20A

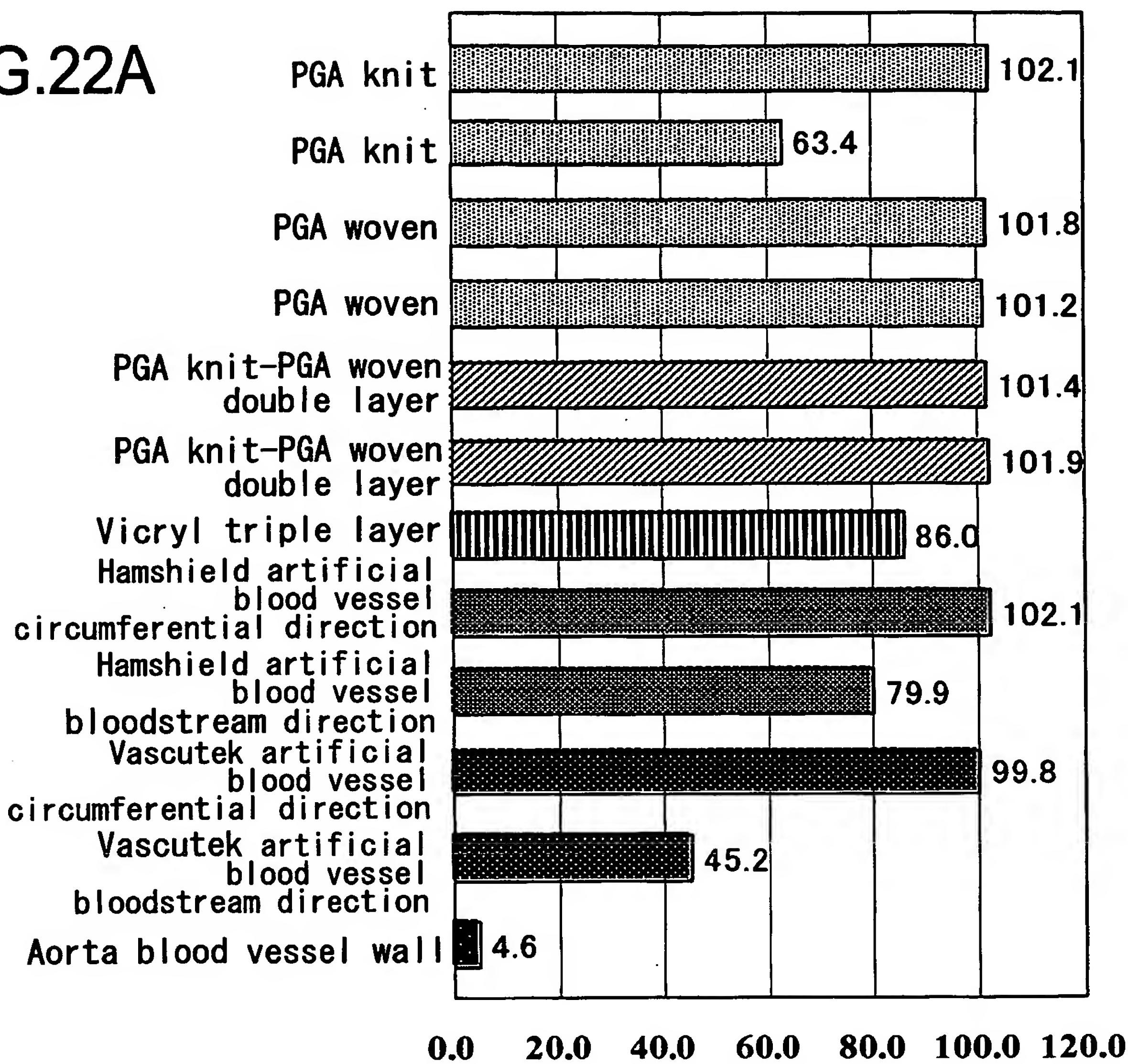
**FIG.20B**

Collagen cross linking



**Knit-woven double layer****FIG.21**

25/64

**FIG.22A**

	Tensile strength
Aorta blood vessel wall	4.6
Vascutek artificial blood vessel bloodstream direction	45.2
Vascutek artificial blood vessel circumferential direction	99.8
Hamshield artificial blood vessel bloodstream direction	79.9
Hamshield artificial blood vessel circumferential direction	102.1
Vicryl triple layer	86.0
PGA knit-PGA woven double layer	101.9
PGA knit-PGA woven double layer	101.4
PGA woven	101.2
PGA woven	101.8
PGA knit	63.4
PGA knit	102.1

26/64

## Tension test: poly(L-lactic acid)

	Tensile strength; N
Aorta blood vessel wall	4.6
Vascutek artificial blood vessel bloodstream direction	45.2
Vascutek artificial blood vessel circumferential direction	99.8
Hamshield artificial blood vessel bloodstream direction	79.9
Hamshield artificial blood vessel circumferential direction	102.1
PGA knit No3 warp	73.8
PGA knit No3 weft	61.2
PLA woven 47.5 warp	43.7
PLA woven 47.5 weft	82.5
PGA knit No3-PLA woven warp	56.5
PGA knit No3-PLA woven weft	98.8

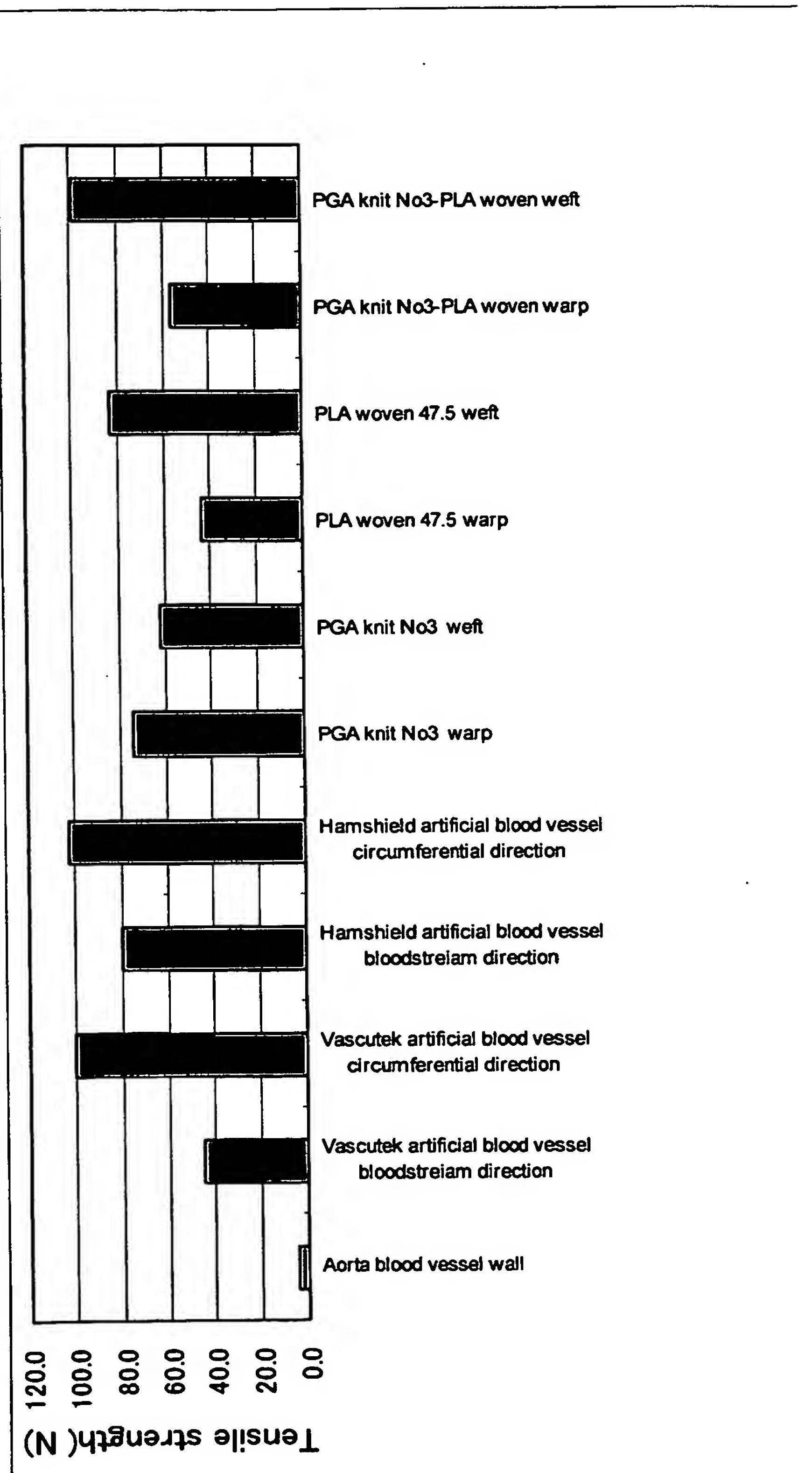
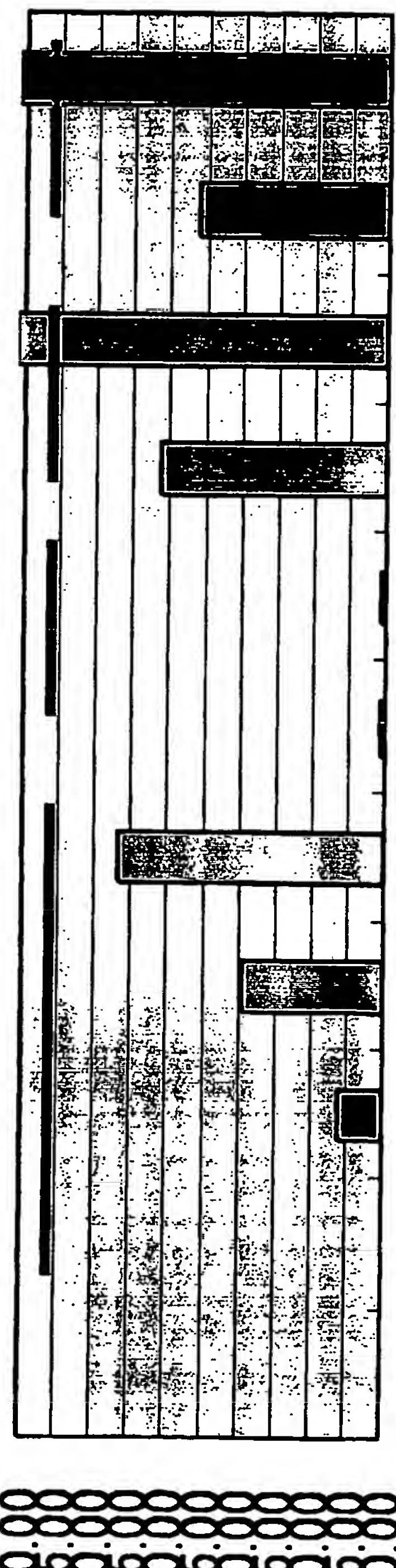


FIG.22B

27/64

FIG.23

Young's modulus; Mpa



MPa

PGA knit No3-PLA  
woven weftPGA knit No3-PLA  
woven warp

PLA woven 47.5 weft

PLA woven 47.5 warp

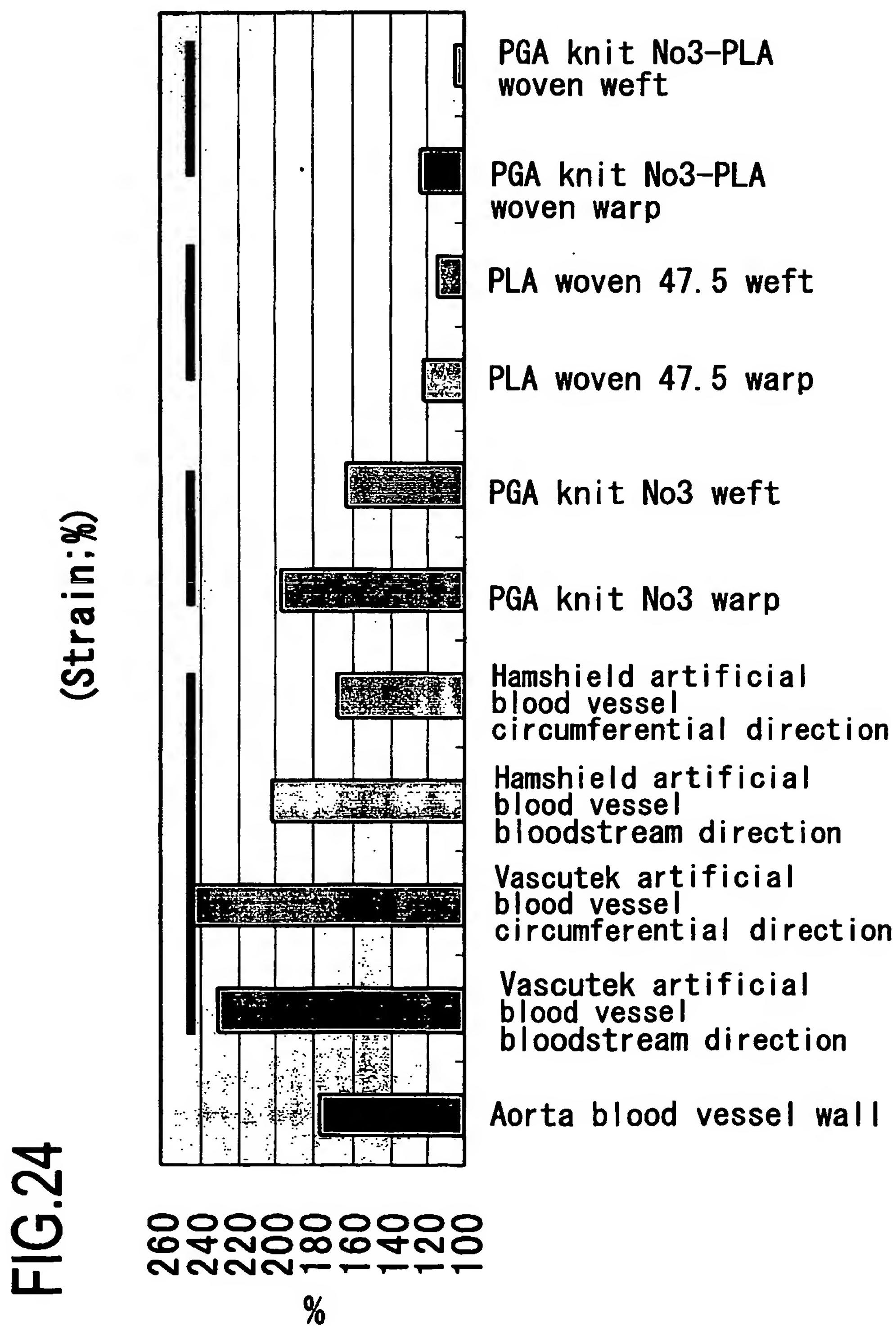
PGA knit No3 weft

PGA knit No3 warp

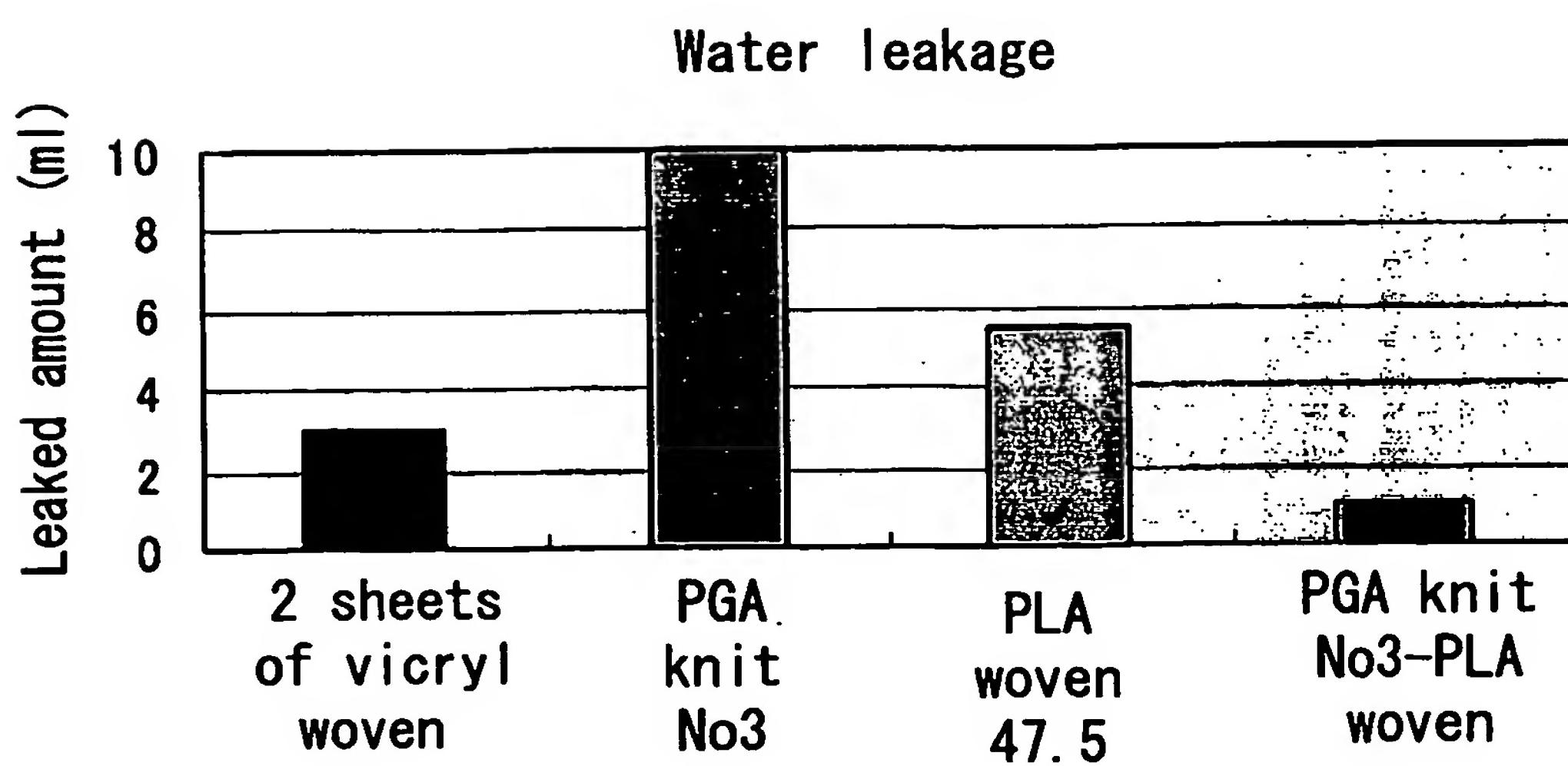
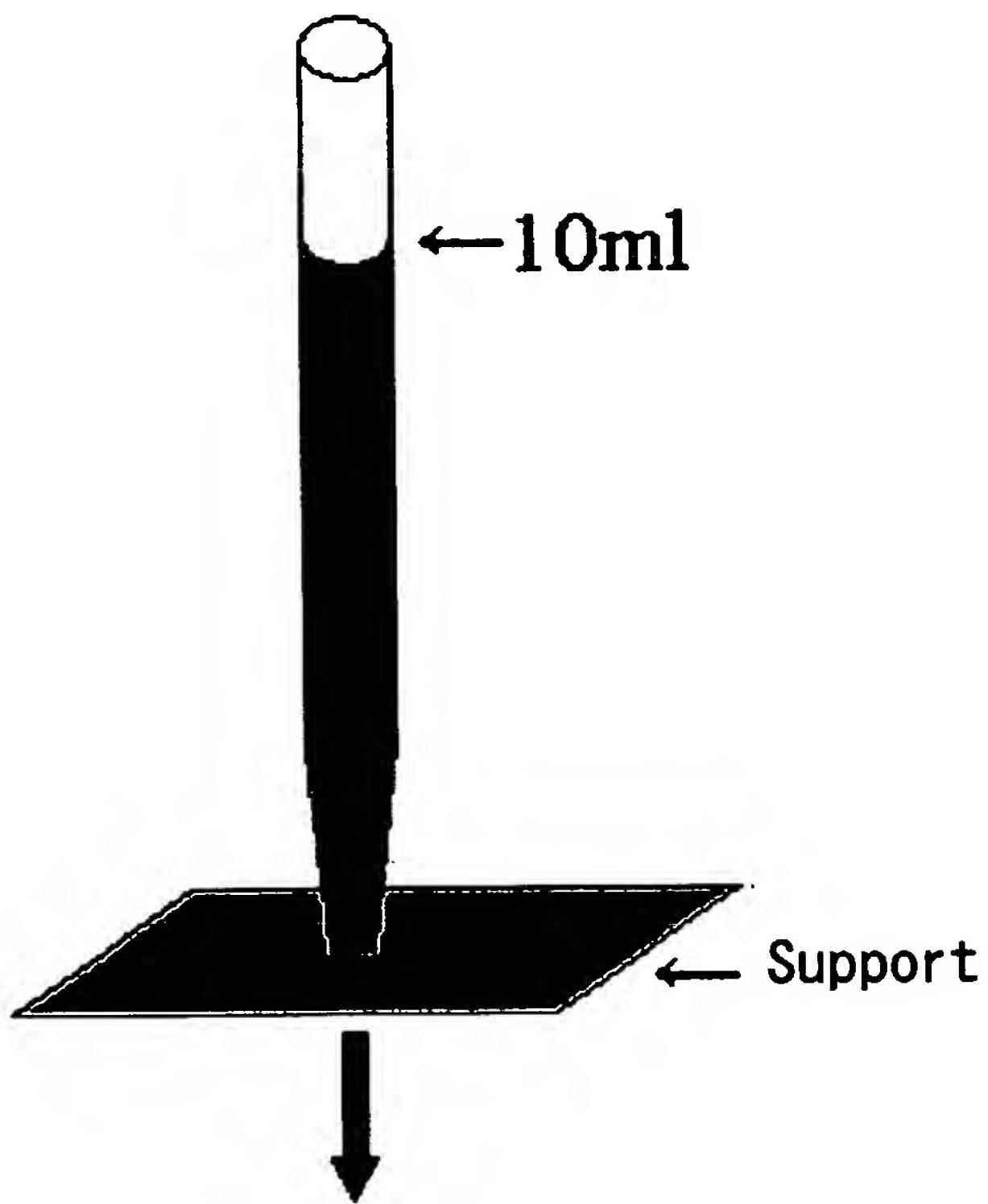
Hamshield artificial  
blood vessel  
circumferential directionHamshield artificial  
blood vessel  
bloodstream directionVascutek artificial  
blood vessel  
circumferential directionVascutek artificial  
blood vessel  
bloodstream direction

Aorta blood vessel wall

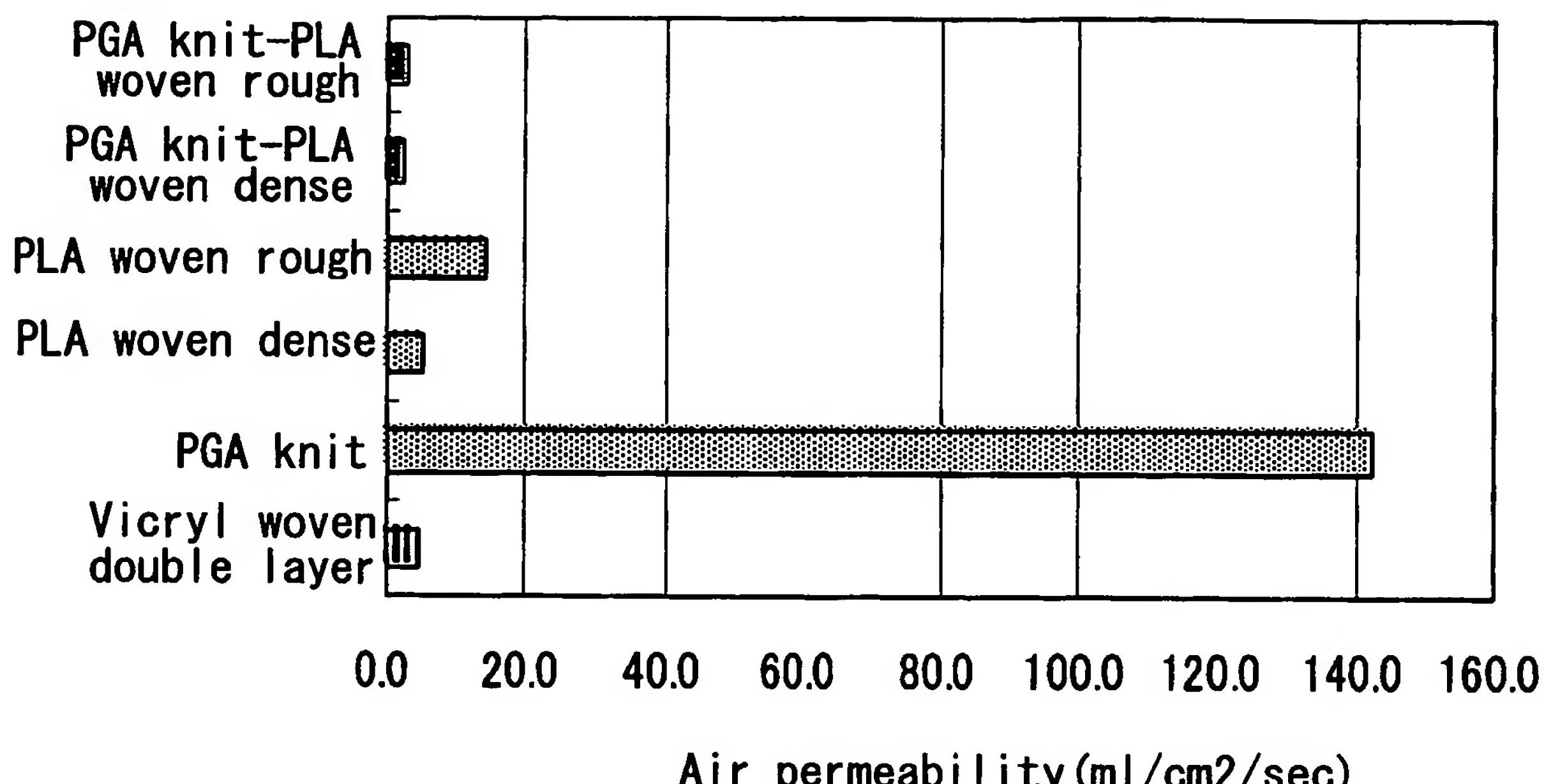
28/64



29/64

**FIG.25**

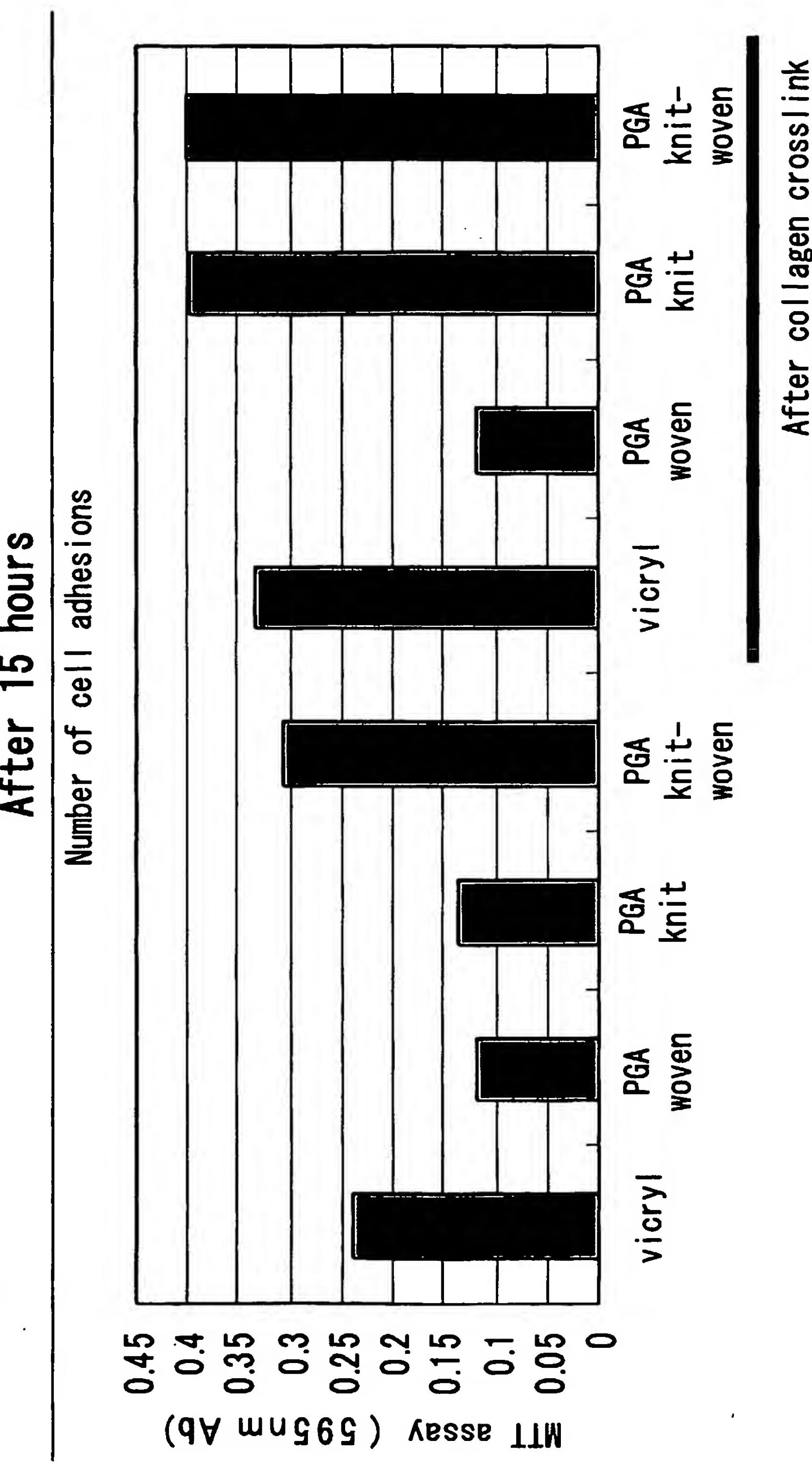
30/64

**FIG.26**Air permeability (ml/cm<sup>2</sup>/sec)

Air permeability test	Air permeability (ml/cm <sup>2</sup> /sec)
Vicryl woven double layer	4.3
PGA knit	142.3
PLA woven dense	5.1
PLA woven rough	14.1
PGA knit-PLA woven dense	2.1
PGA knit-PLA woven rough	2.6

31/64

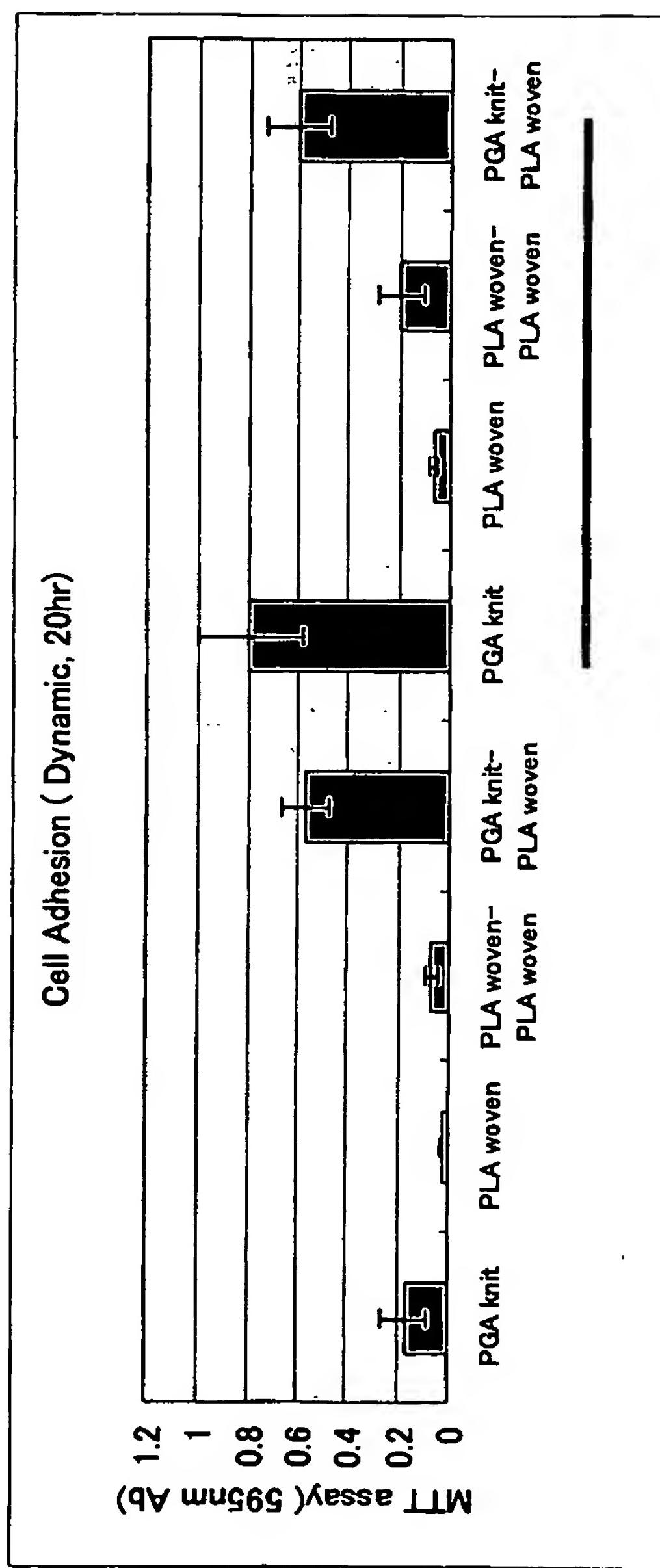
FIG.27A



32/64

FIG.27B

## Cell adhesion test



After collagen crosslinking

	Mean	S.D.
PGA knit	0.174	0.091
PLA woven	0.024	0.008
PLA woven-PLA woven	0.071	0.028
PGA knit-PLA woven	0.572	0.092
PGA knit	0.792	0.205
PLA woven	0.068	0.016
PLA woven-PLA woven	0.198	0.094
PGA knit-PLA woven	0.606	0.123

After collagen crosslinking

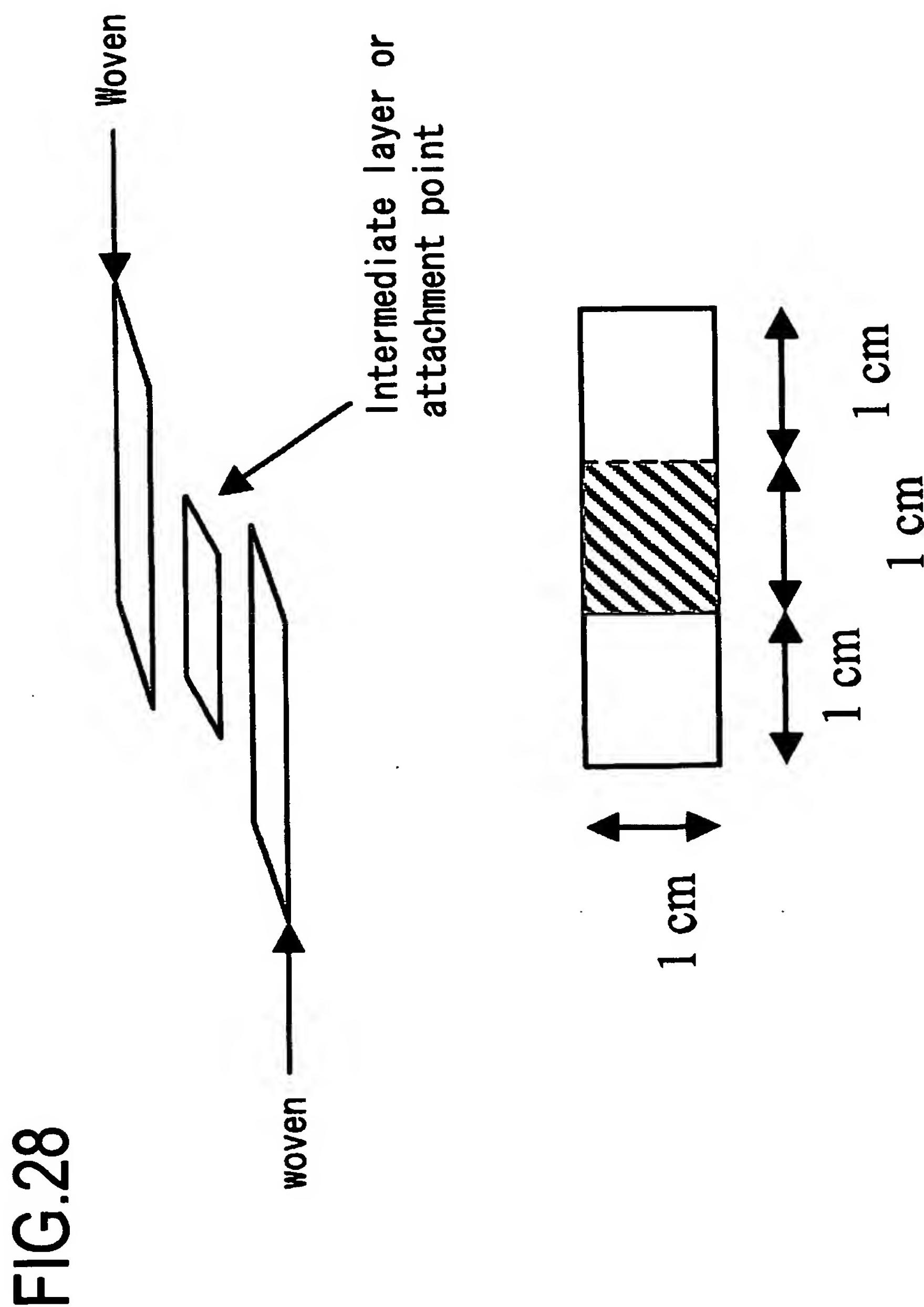
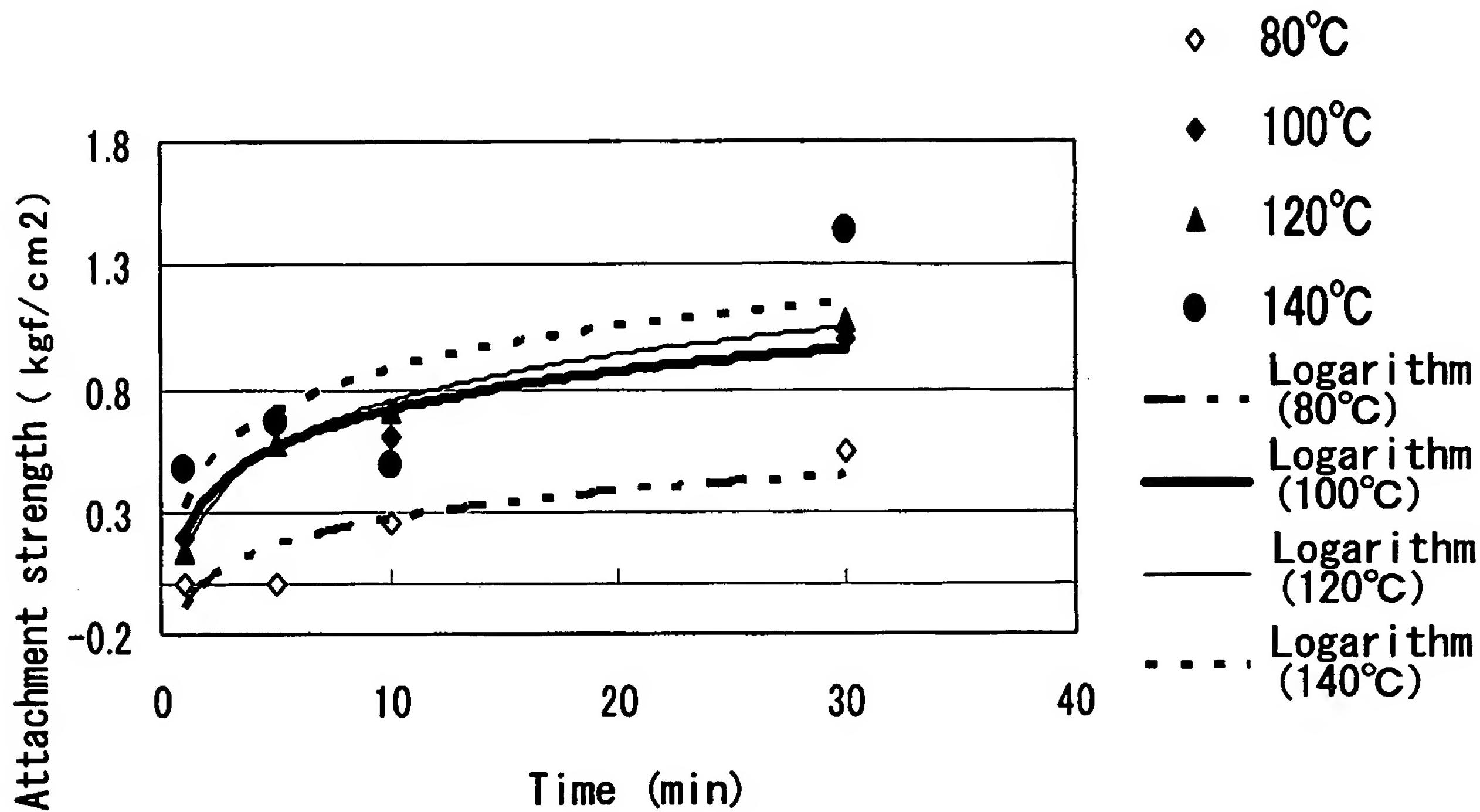


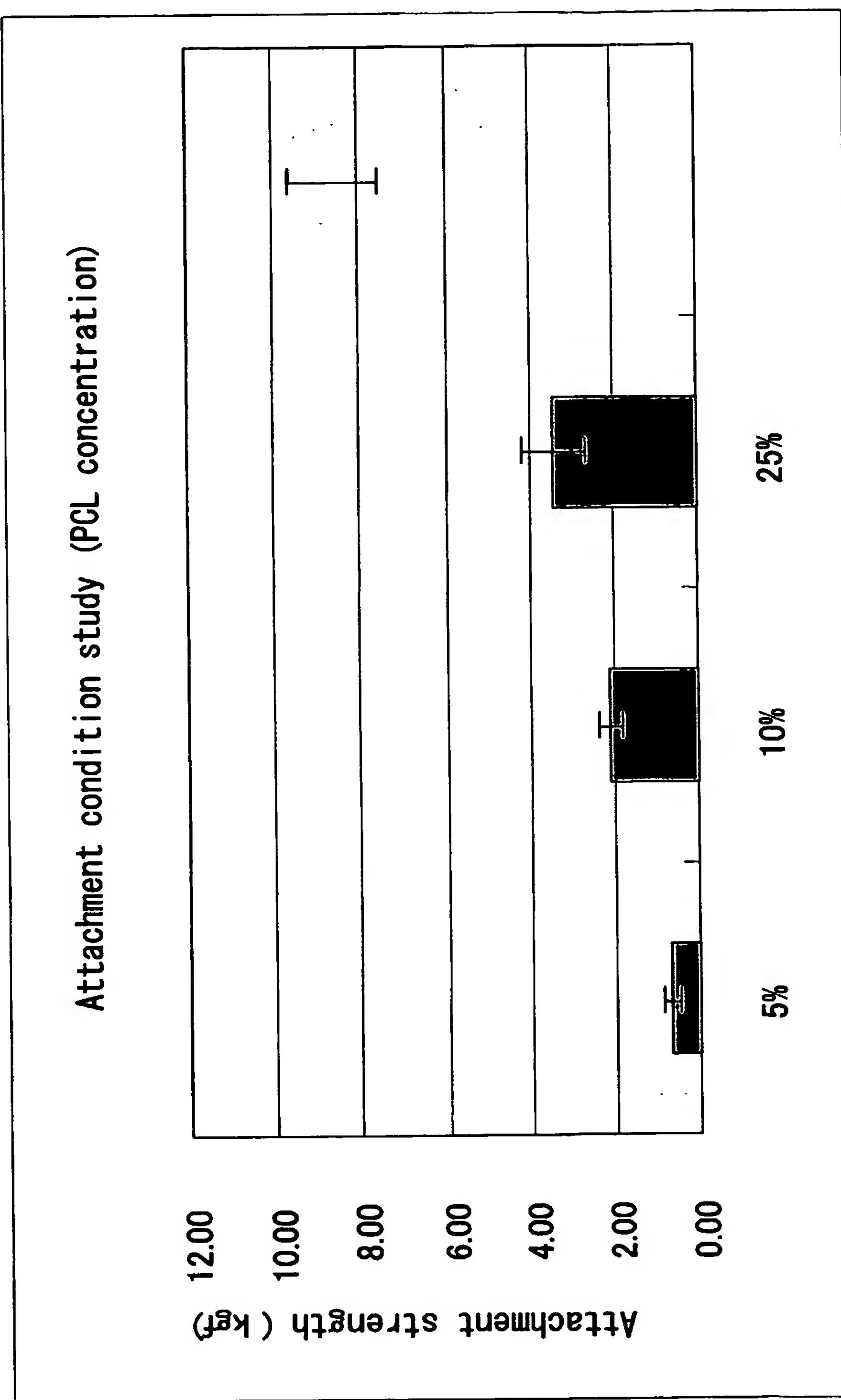
FIG.28

**FIG.29A****Attachment strength Study on conditions**

	80°C	100°C	120°C	140°C
1	0	0.1945	0.1363	0.4682
5	0	0.6553	0.5782	0.6634
10	0.257	0.6029	0.7035	0.4879
30	0.5395	0.9898	1.0695	1.4402

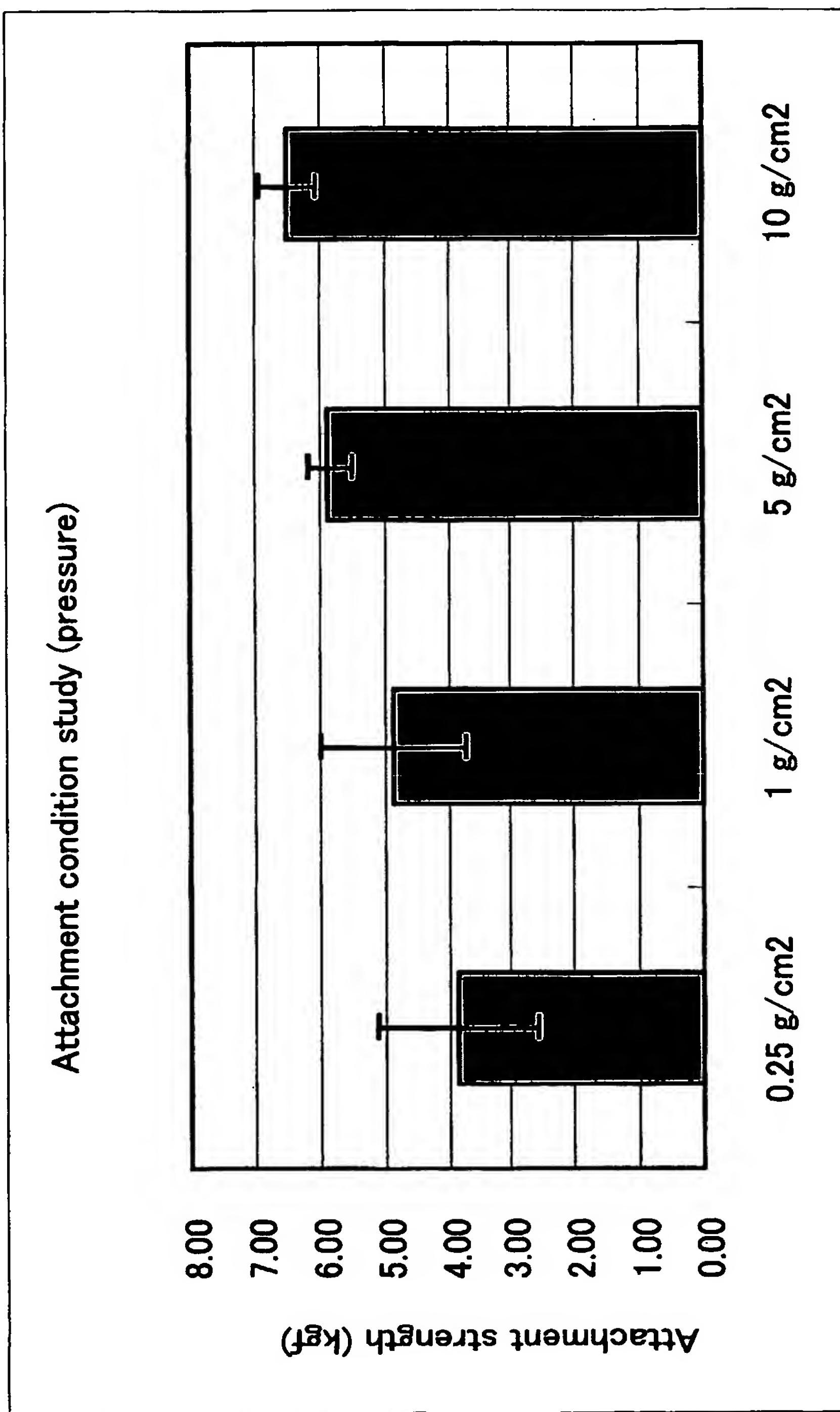
35/64

FIG.29B



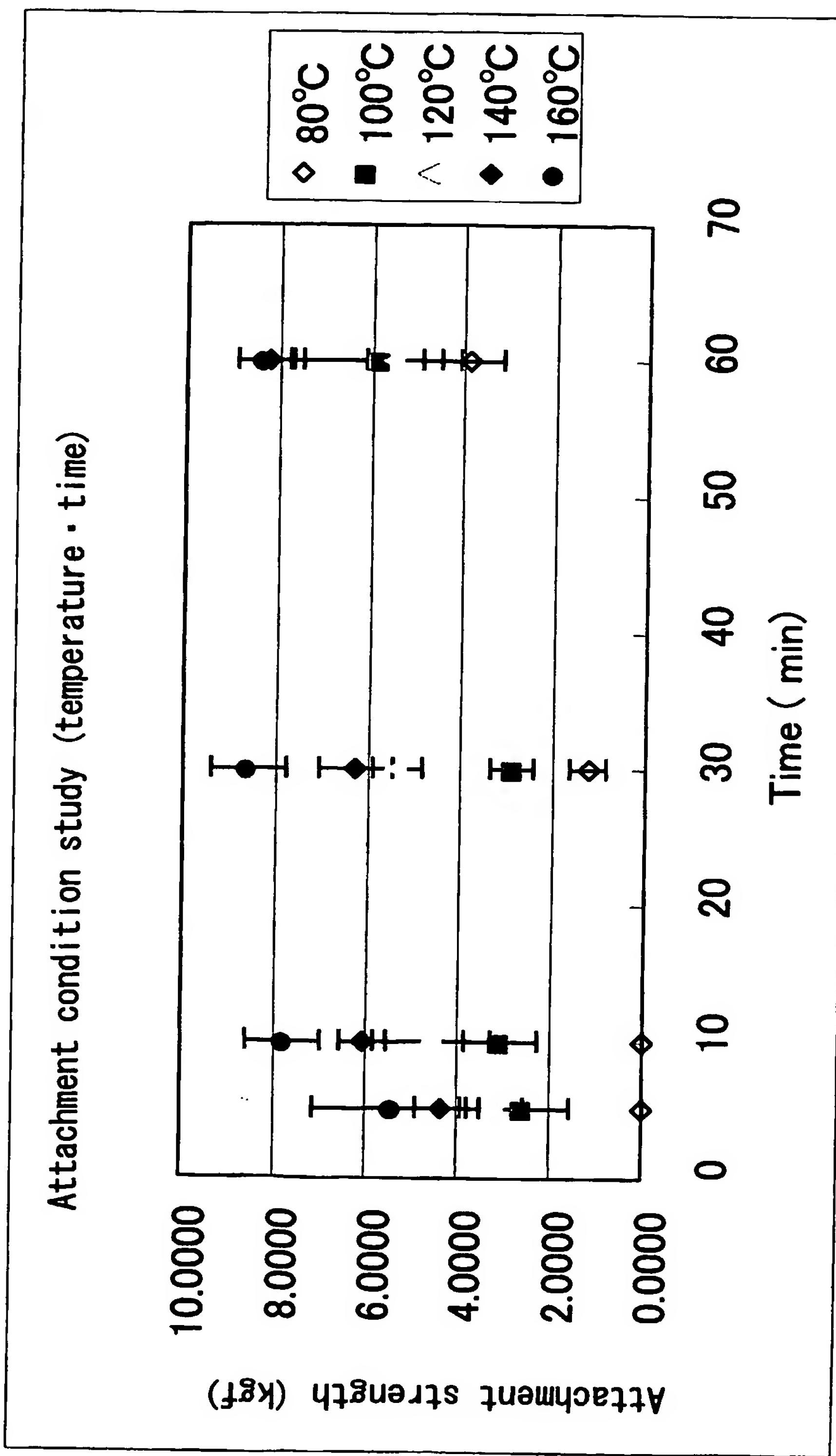
36/64

FIG.29C



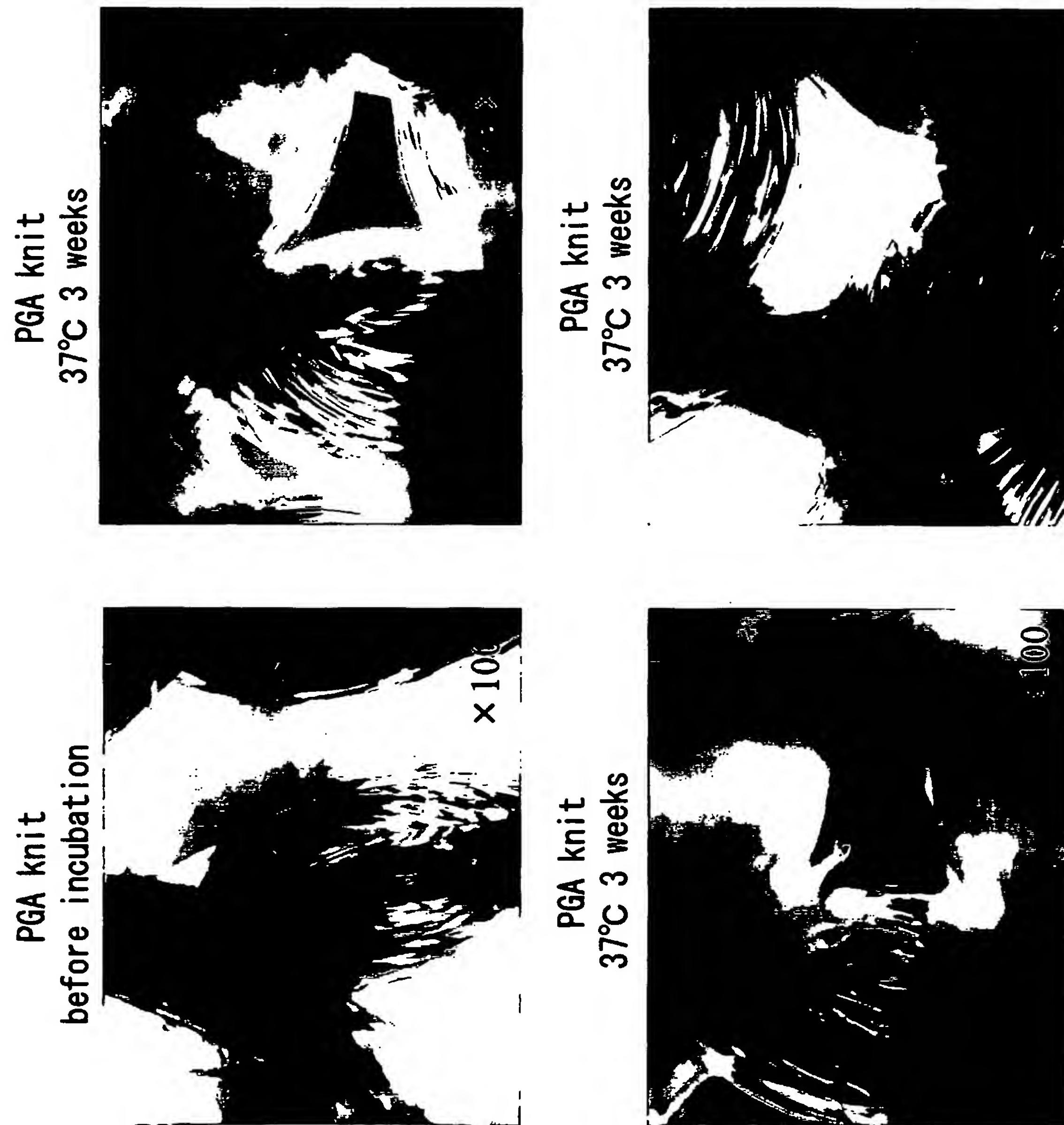
37/64

FIG.29D



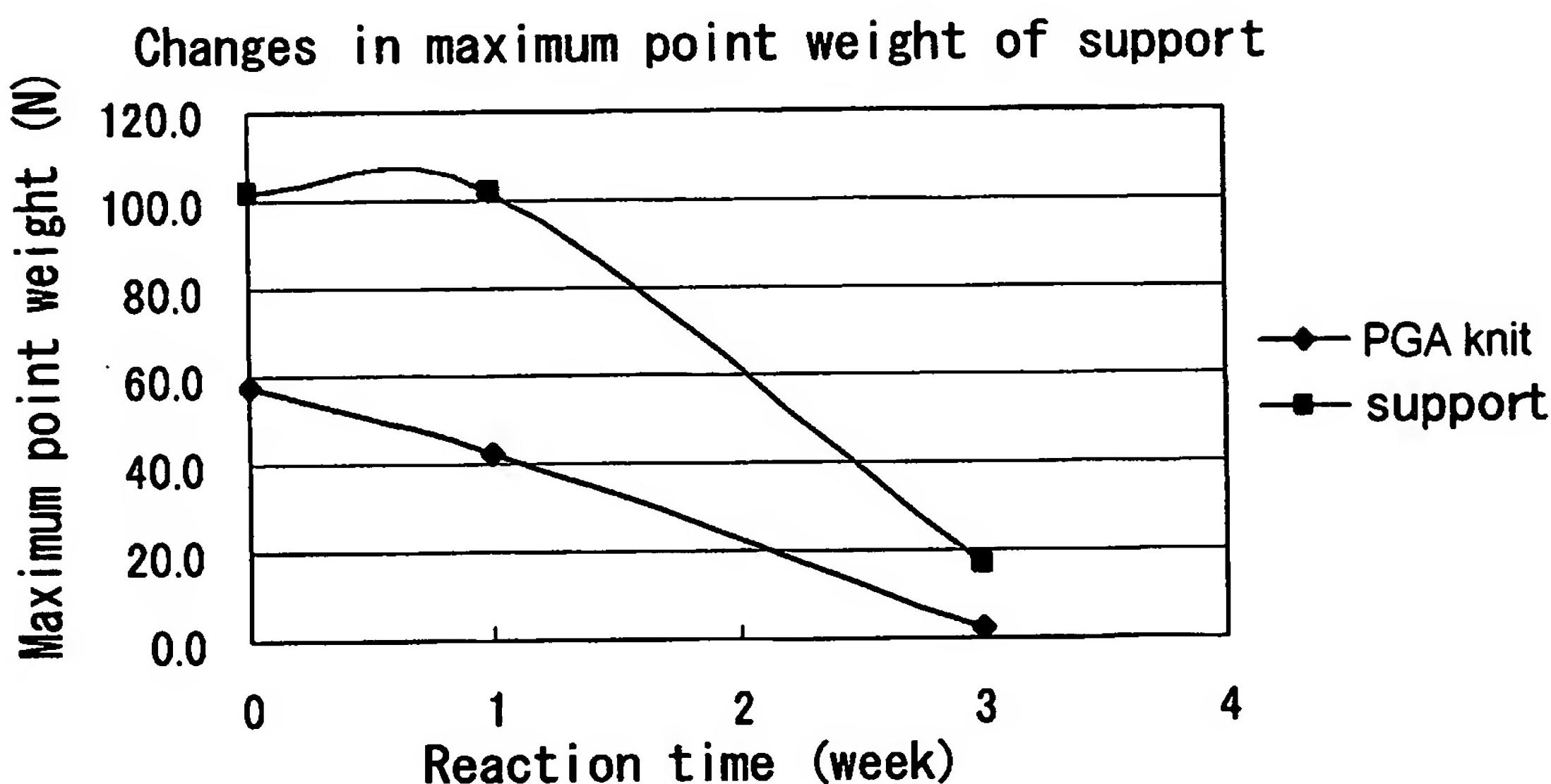
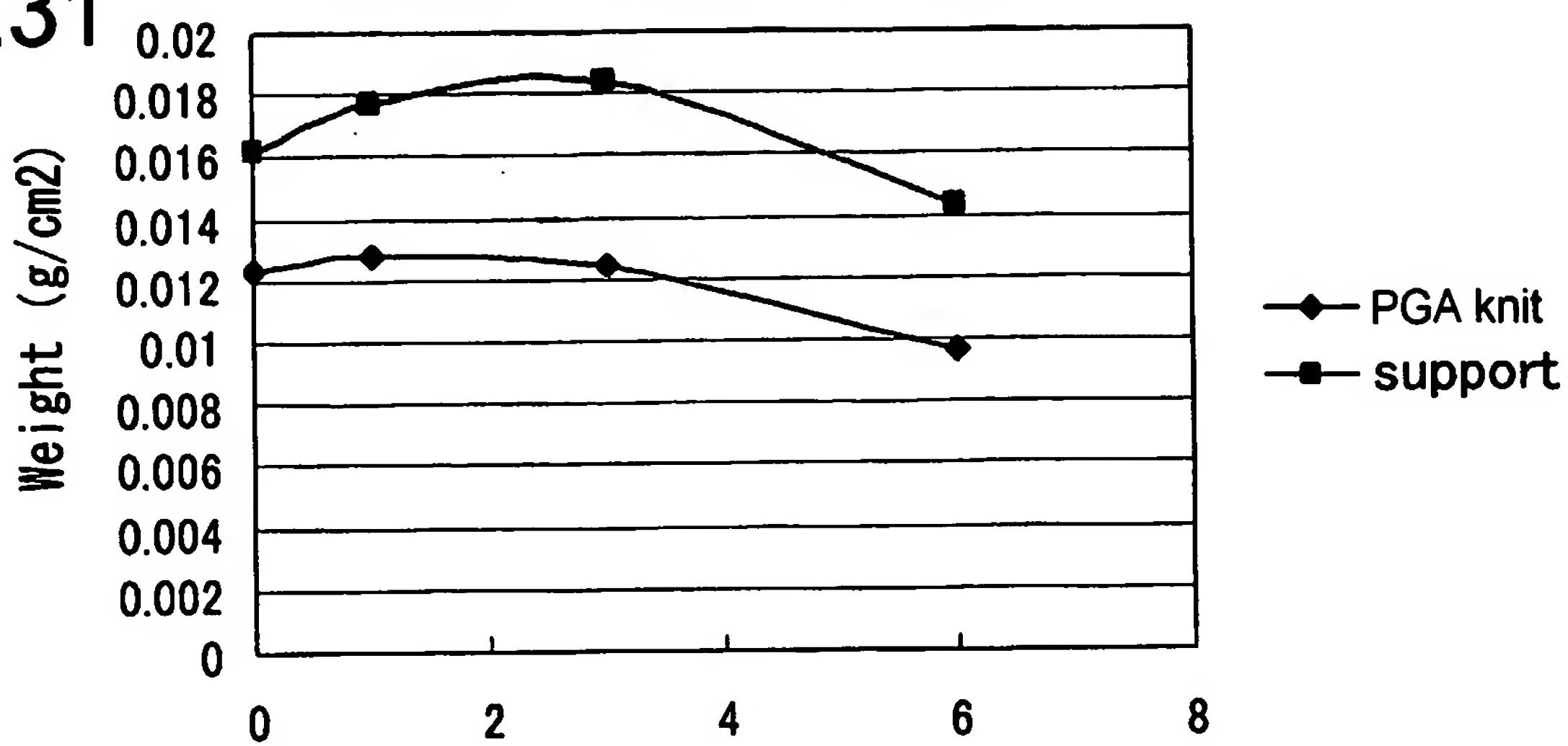
38/64

FIG.30

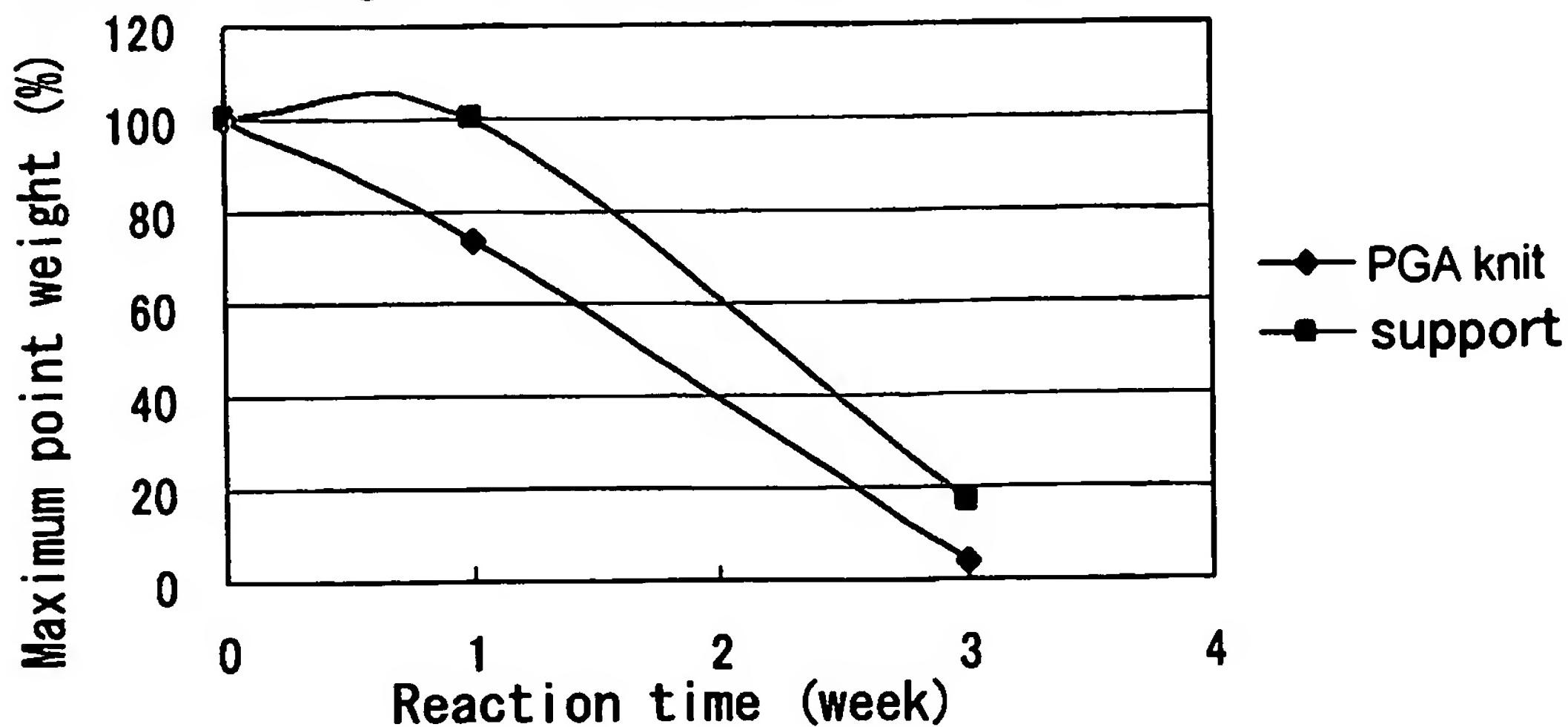


**FIG.31**

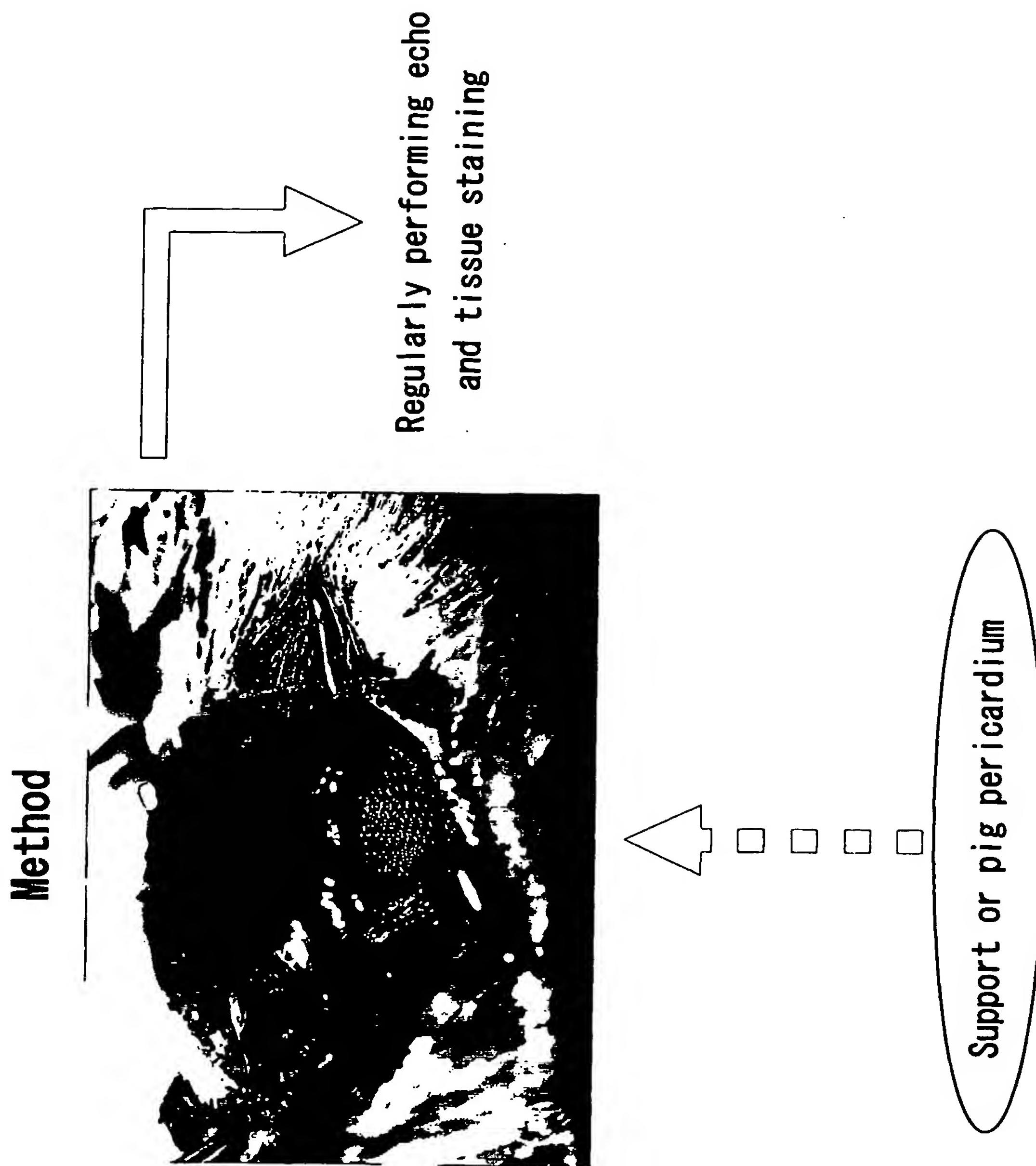
39/64  
Changes in weight of support



Rate of changes in maximum point weight of support



**FIG.32**

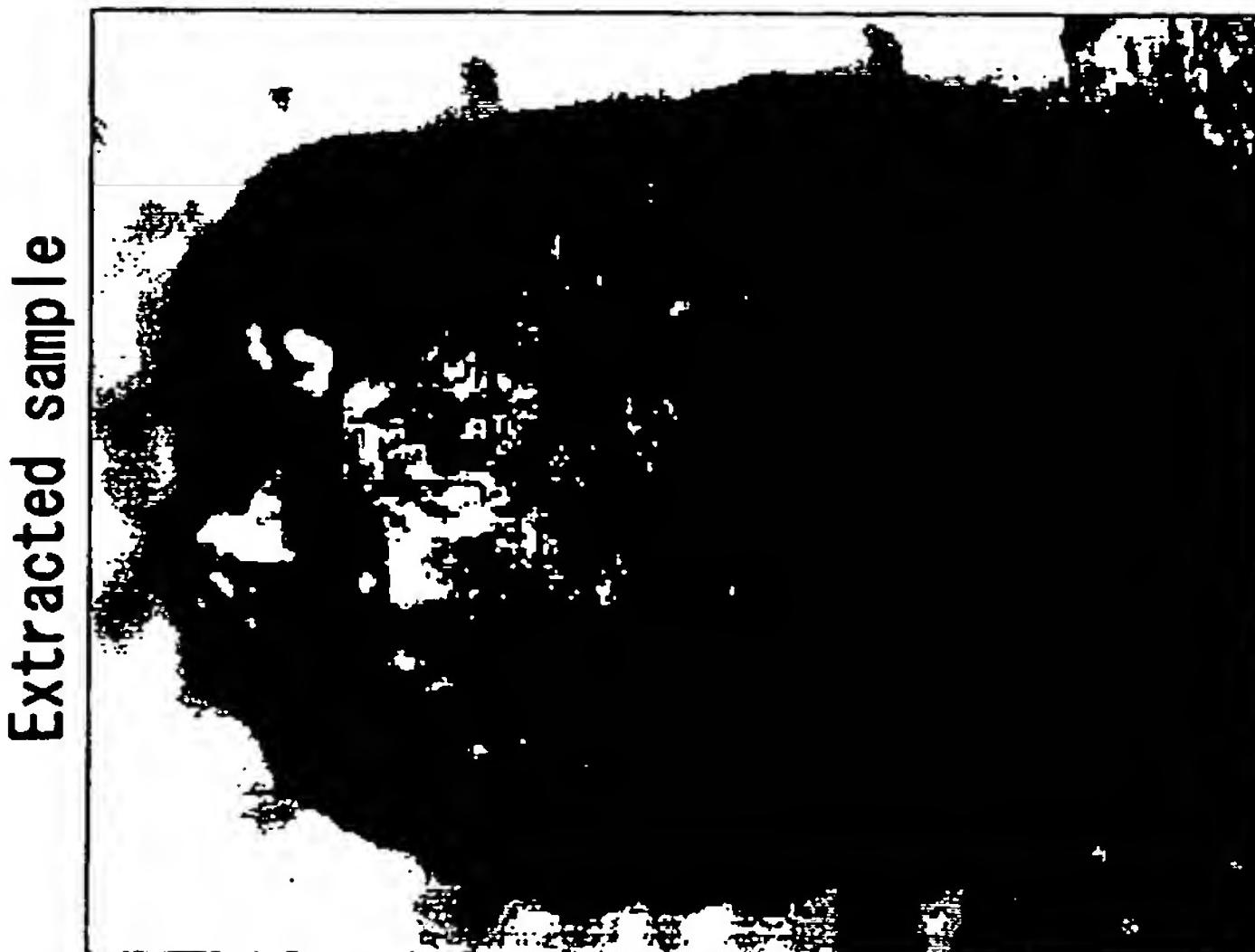


41/64

FIG.33

Rat lig Sham  
One month

Extracted sample



HE staining



42/64

FIG. 34

Rat lig patch implantation  
One month

Extracted sample



HE staining

lig patch only 1mon X 40

43/64

FIG.35

Rat lig patch (collagen I+IV) implantation  
One month

HE staining



Collagen + IV lig 1 Mo

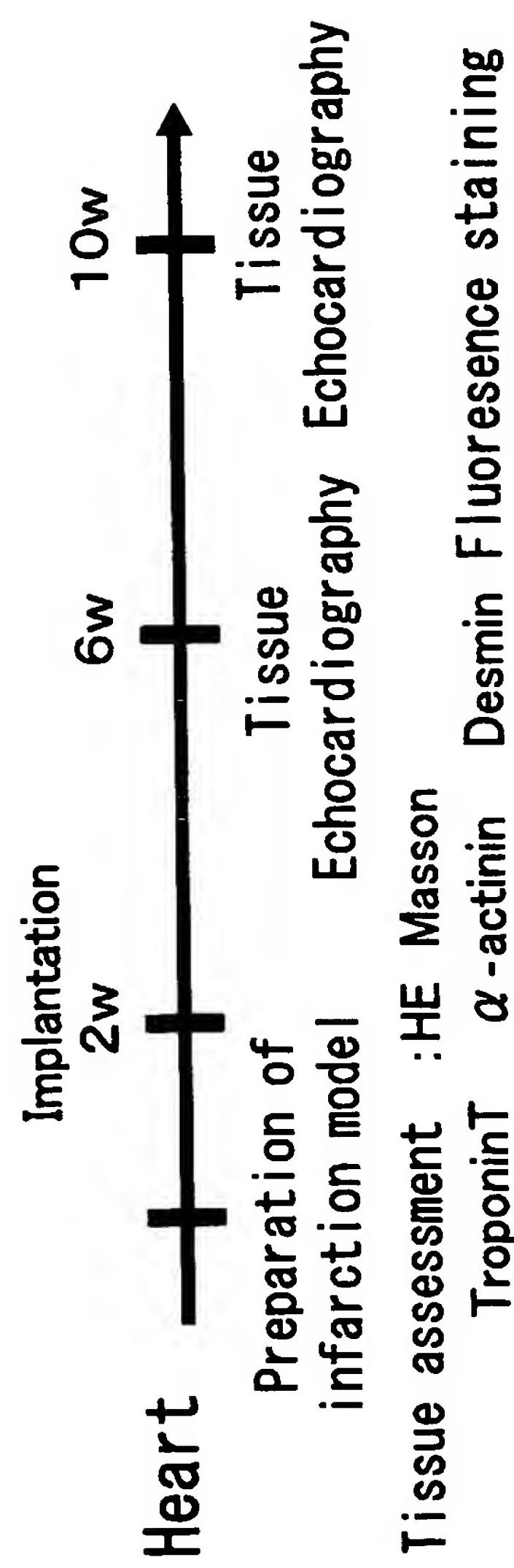
44/64

# FIG.36

## Implantation into rat myocardial infarction site



- sham
- Cardiovascular repair material
- Cardiovascular repair material (collagen I+IV, laminin)



45/64

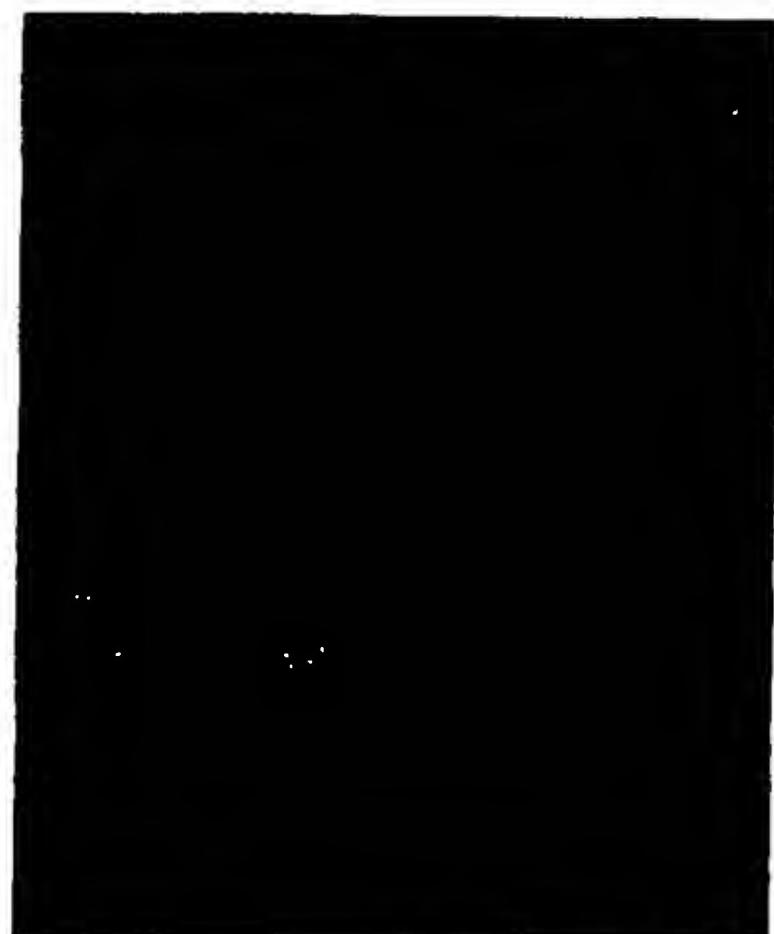
# FIG.37

Implantation into rat myocardial infarction site  
(cardiovascular repair material-implanted group)

Extracted sample



Desmin staining

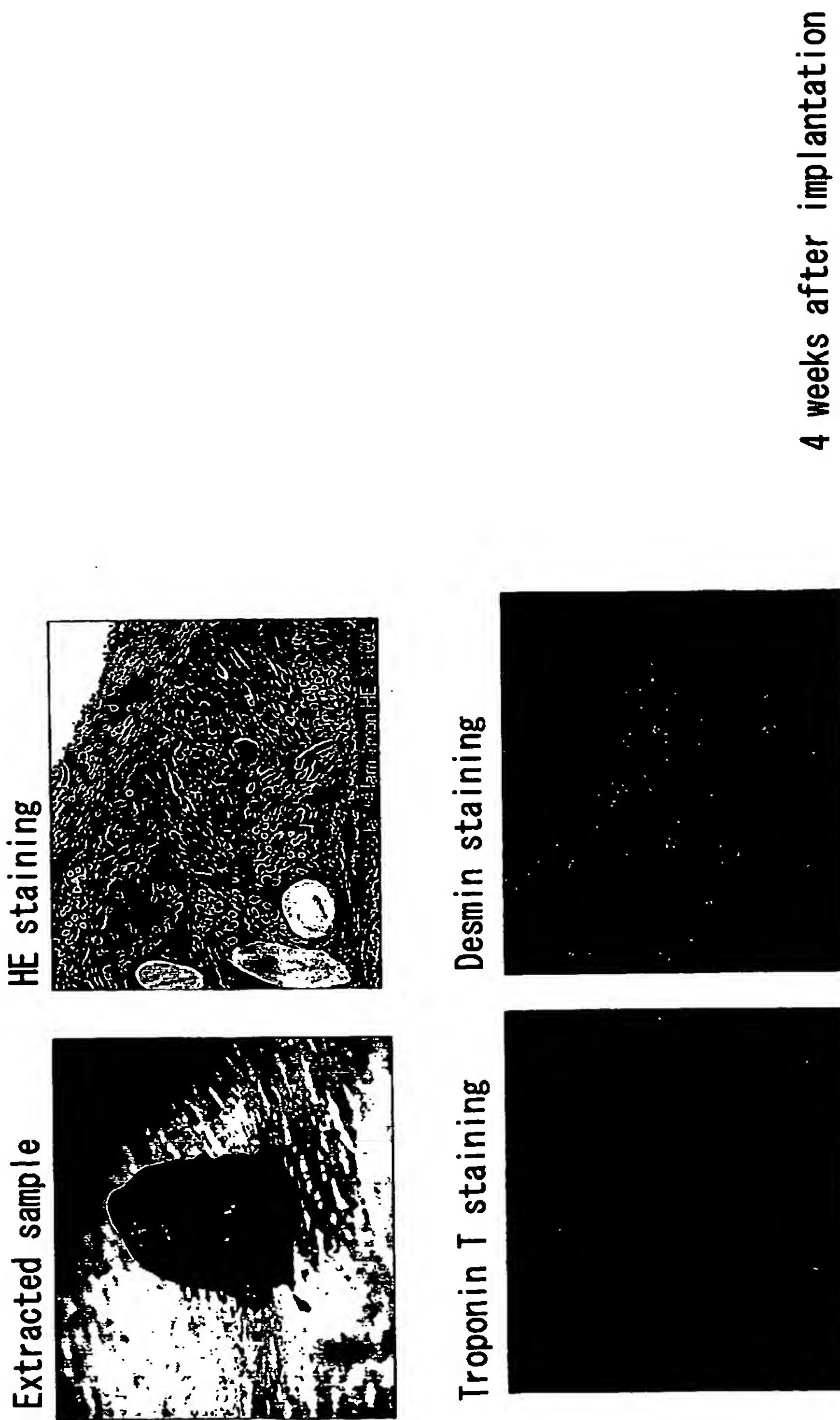


4 weeks after implantation

46/64

# FIG.38

Implantation into rat myocardial infarction site (cardiovascular repair material+type I collagen+type IV collagen+aminin+laminin group)



47/64

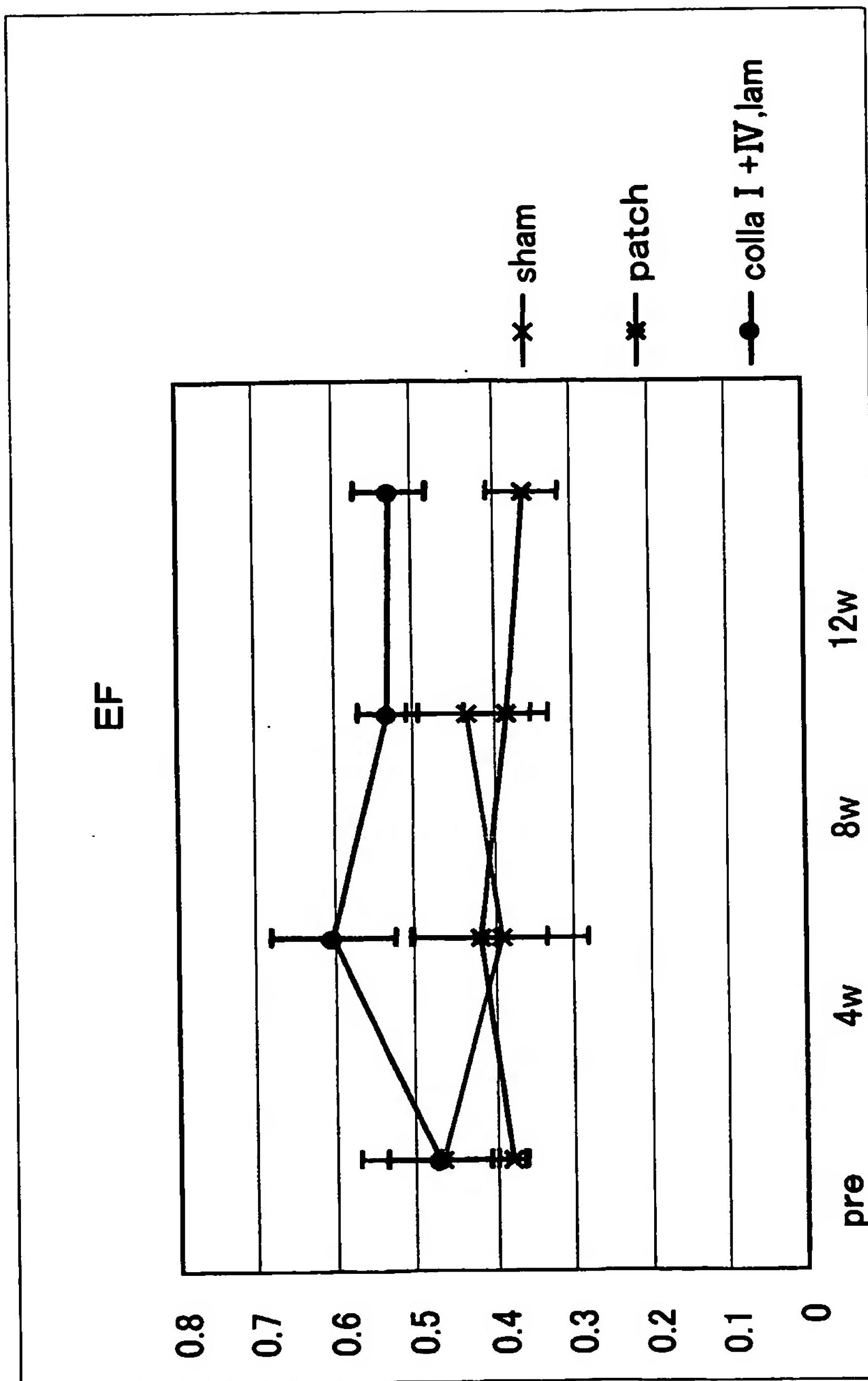
**FIG.39****Assessment of implantation into rat myocardial infarction site**

FIG.40

## Implantation into the dorsum of rat



## Implanted material

- Control patch
  - Cardiovascular repair patch  
(colla I +F-HGF)
  - Cardiovascular repair patch  
(colla I +IV, laminin)



## Tissue assessment :HE Masson

## TroponinT      $\alpha$ - actinin

## Desmin Fluorescence

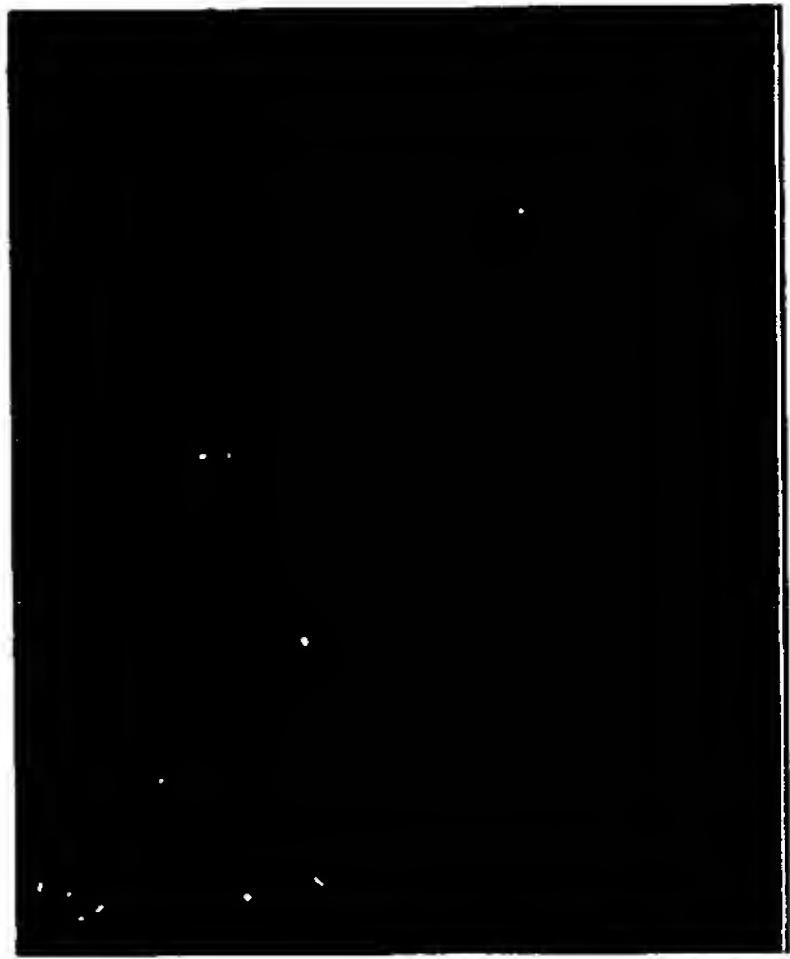
## Tissue PCR

49/64

# FIG.41

Implantation into the dorsum of rat  
(cardiovascular repair material+type I collagen+HGF group)

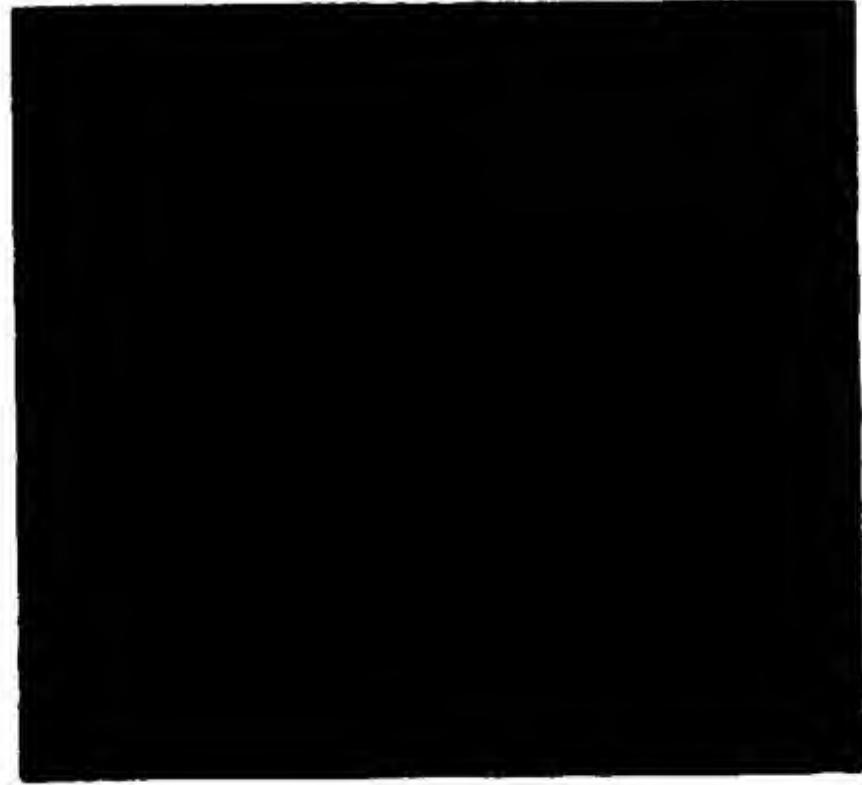
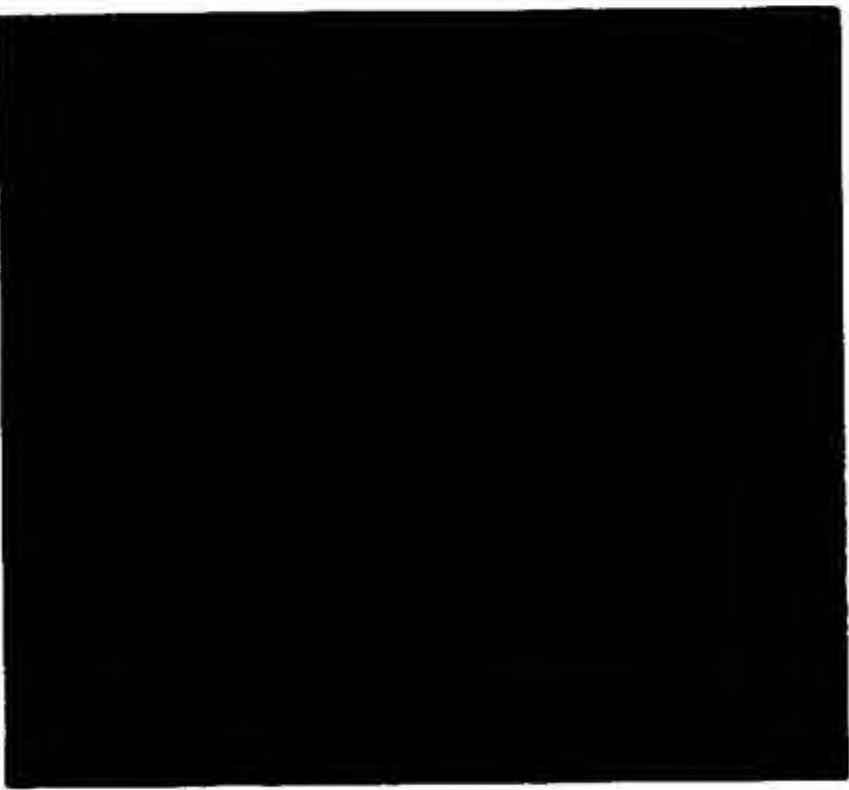
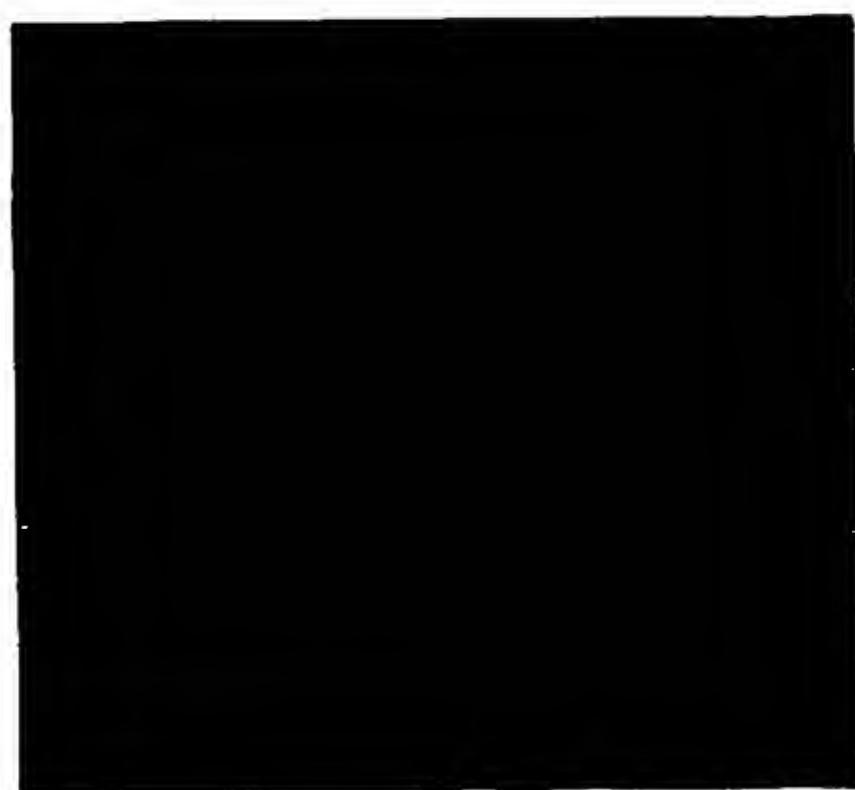
Implanted material: PLGA patch (collagen I)  $\times$  100



50/64

**FIG.42**

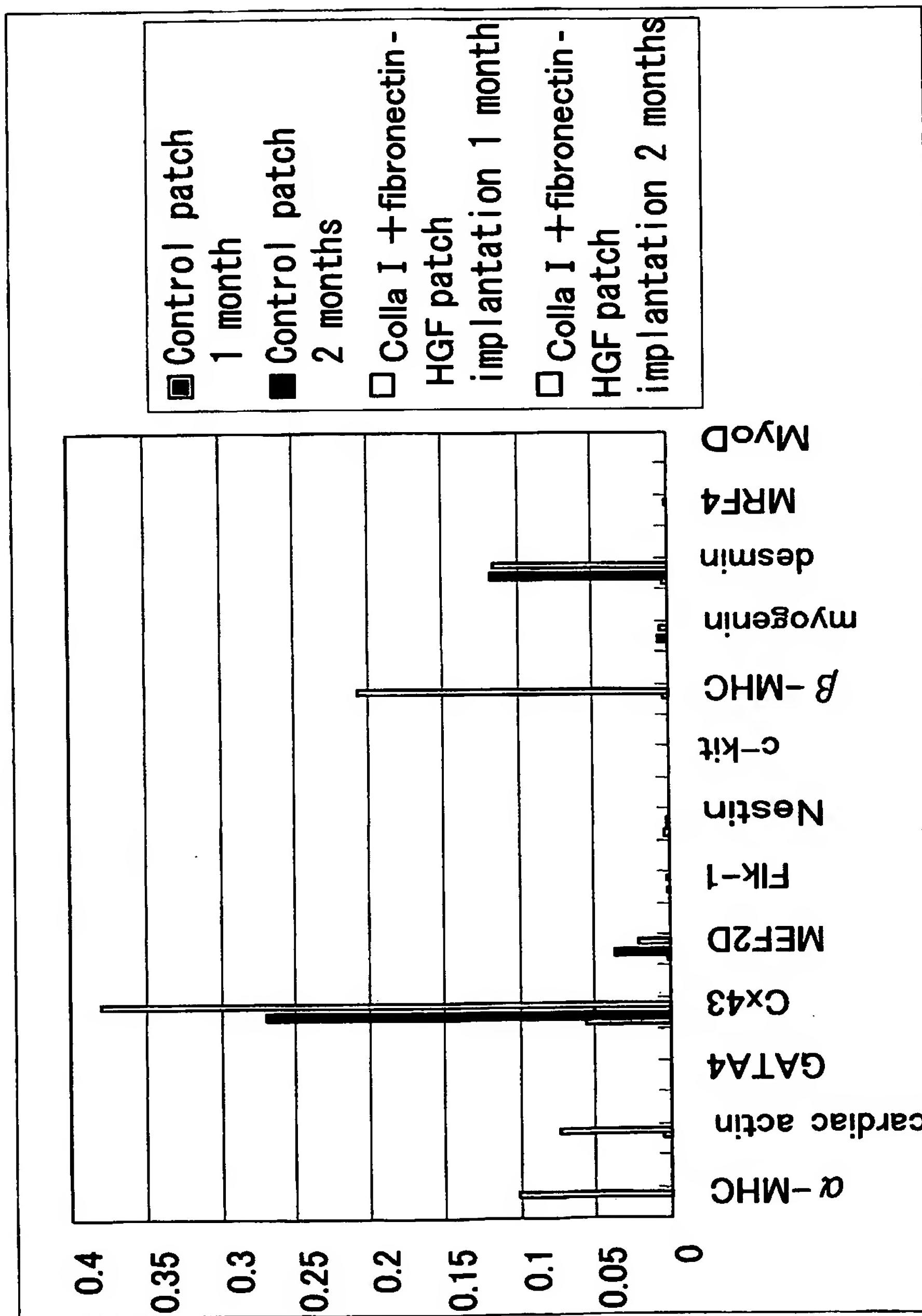
Implantation into the dorsum of rat  
(cardiovascular repair material+type I collagen+HGF group)

Actinin  $\times 400$ TroponinT  $\times 400$ Desmin  $\times 400$ 

*4 weeks after  
implantation*

51/64

**FIG.43**  
**Implantation into the dorsum of rat**  
 (cardiovascular repair material+type I collagen+HGF group)  
**real-time PCR**

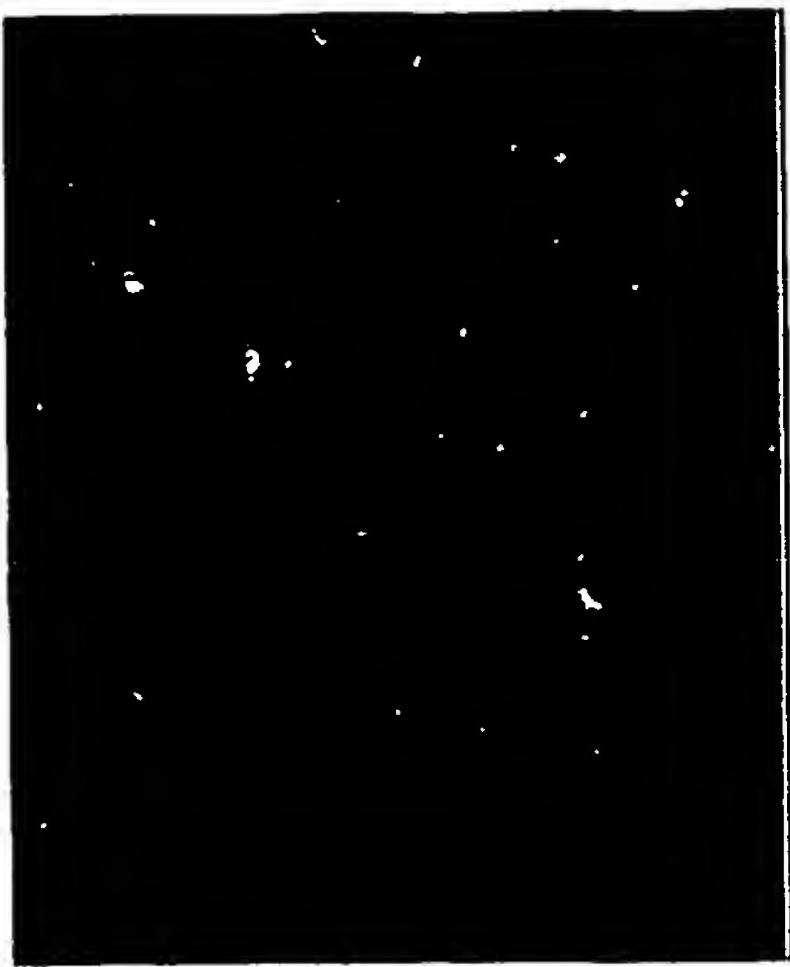


52/64

# FIG.44

Implantation into the dorsum of rat (cardiovascular repair material+type I collagen+type IV collagen+ laminin-implanted group)

Implanted material: PLGA patch (collagen I+IV, lam)  $\times$  100

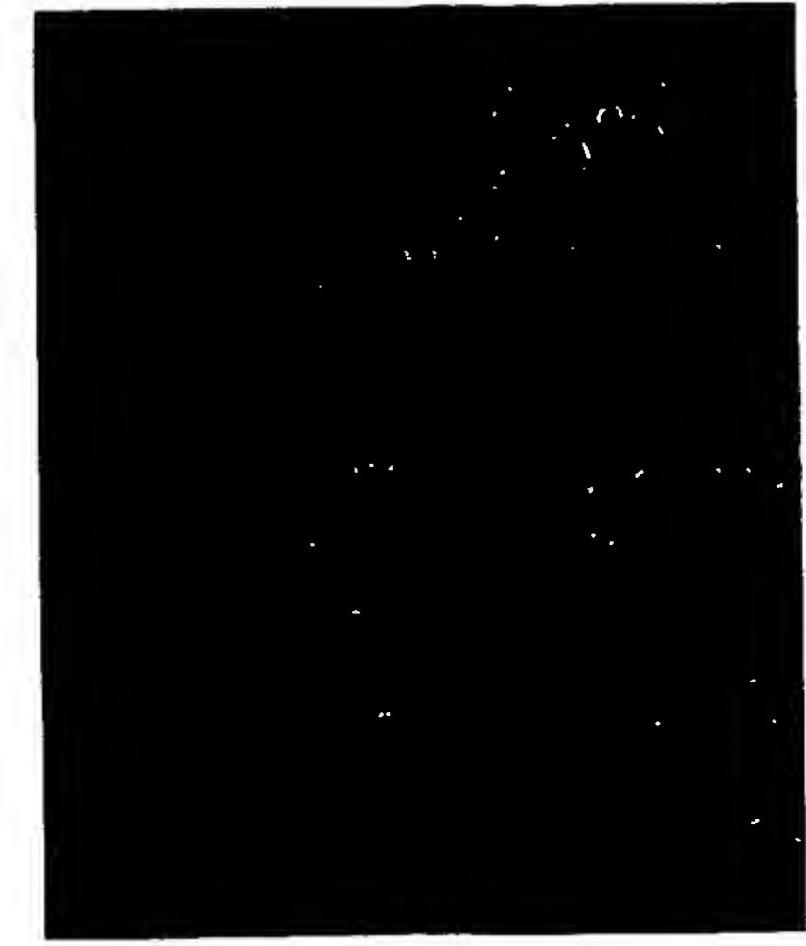
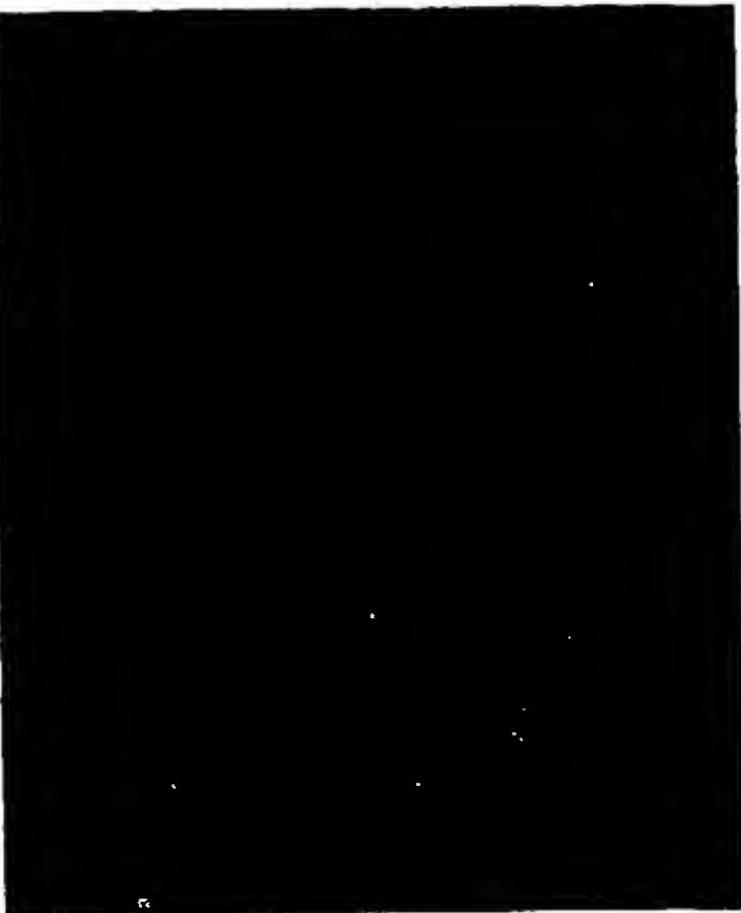


Extracted sample



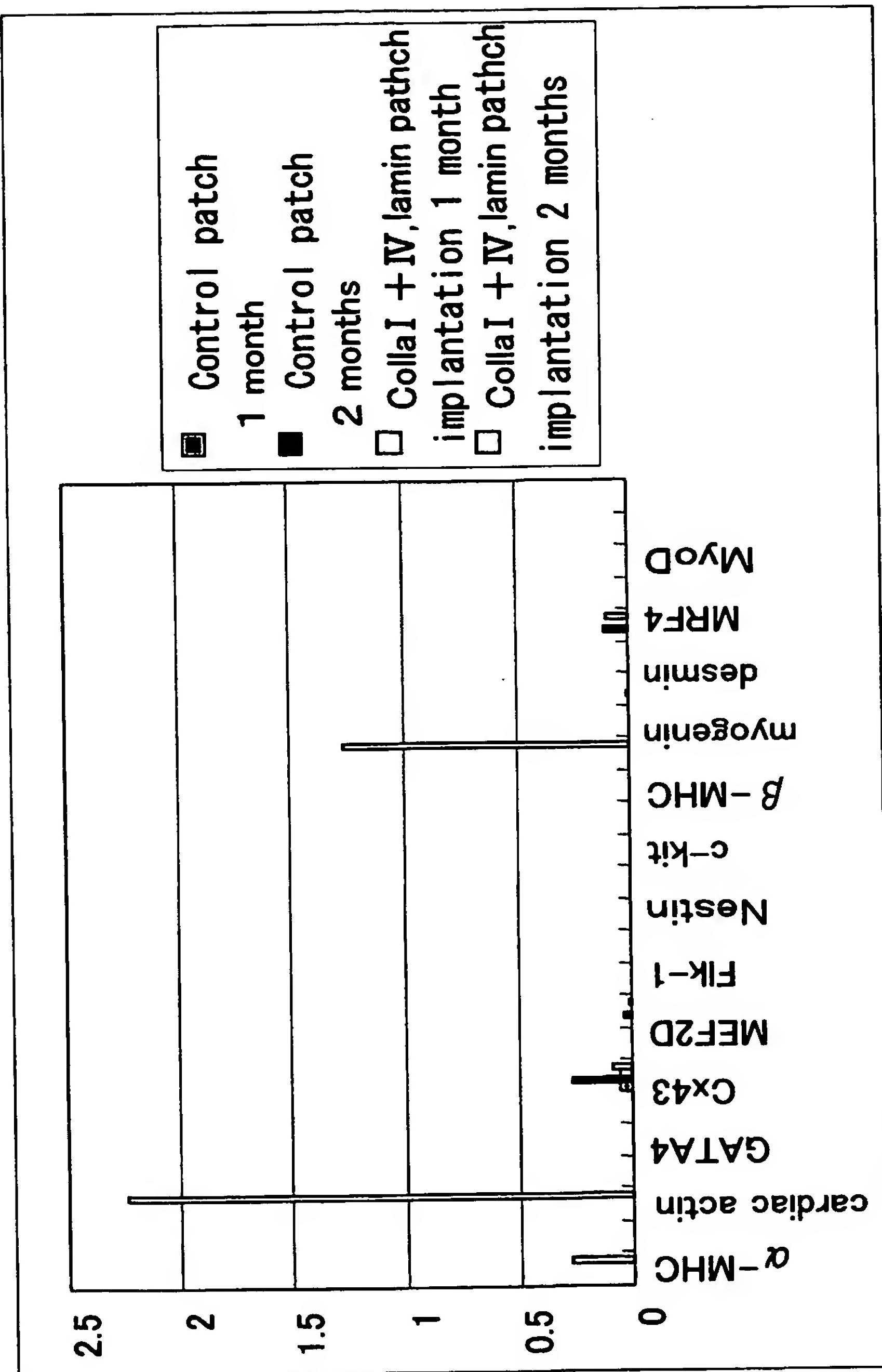
53/64

**FIG.45**  
Implantation into the dorsum of rat (cardiovascular repair material+type I  
collagen+type IV collagen+laminin+implanted group)

Actinin  $\times 400$ TroponinT  $\times 400$ Desmin  $\times 400$ *4 weeks after  
implantation*

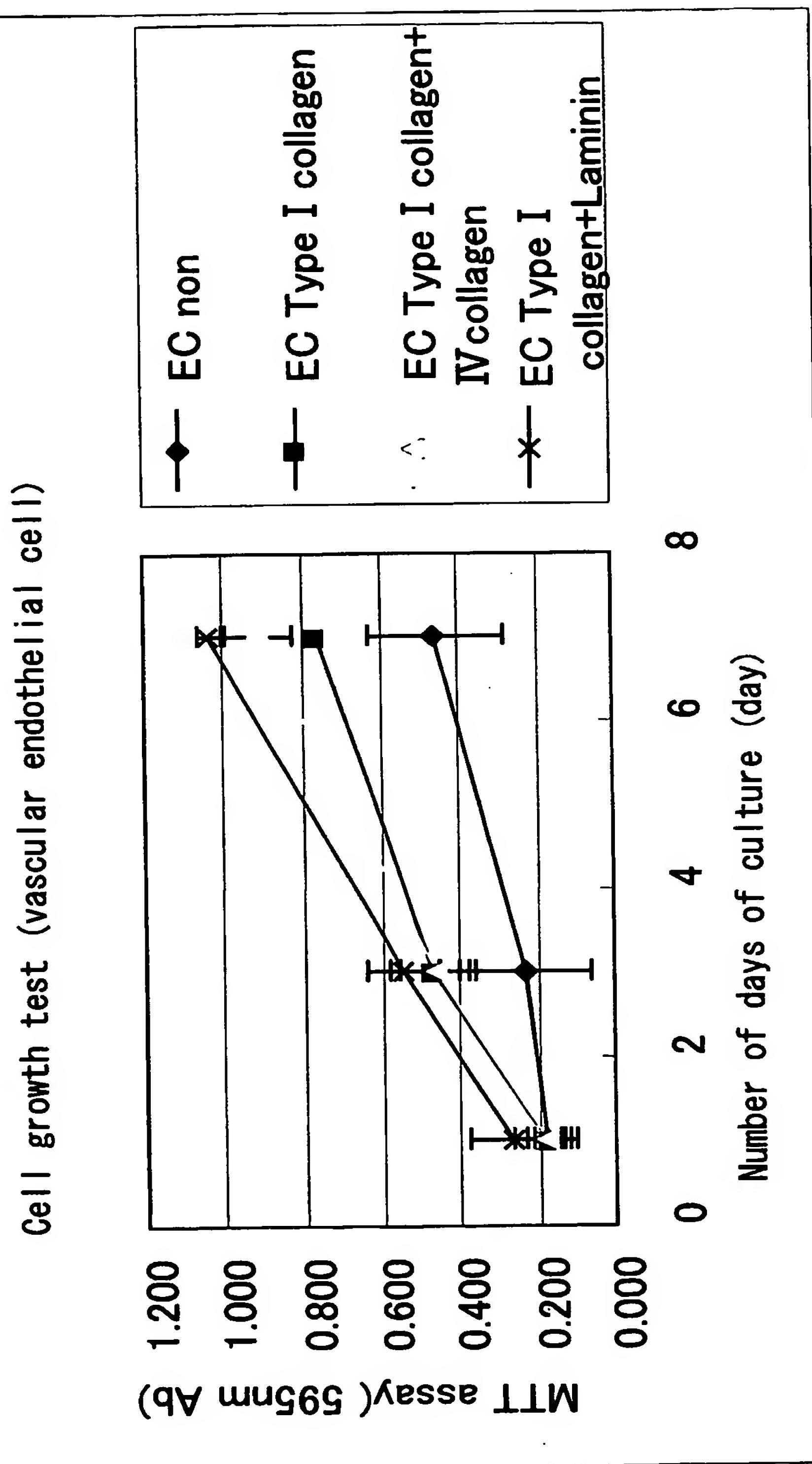
54/64

**FIG.46**  
**Implantation into the dorsum of rat**  
**(cardiovascular repair material+type I collagen+**  
**type IV collagen+ laminin-implanted group)**



55/64

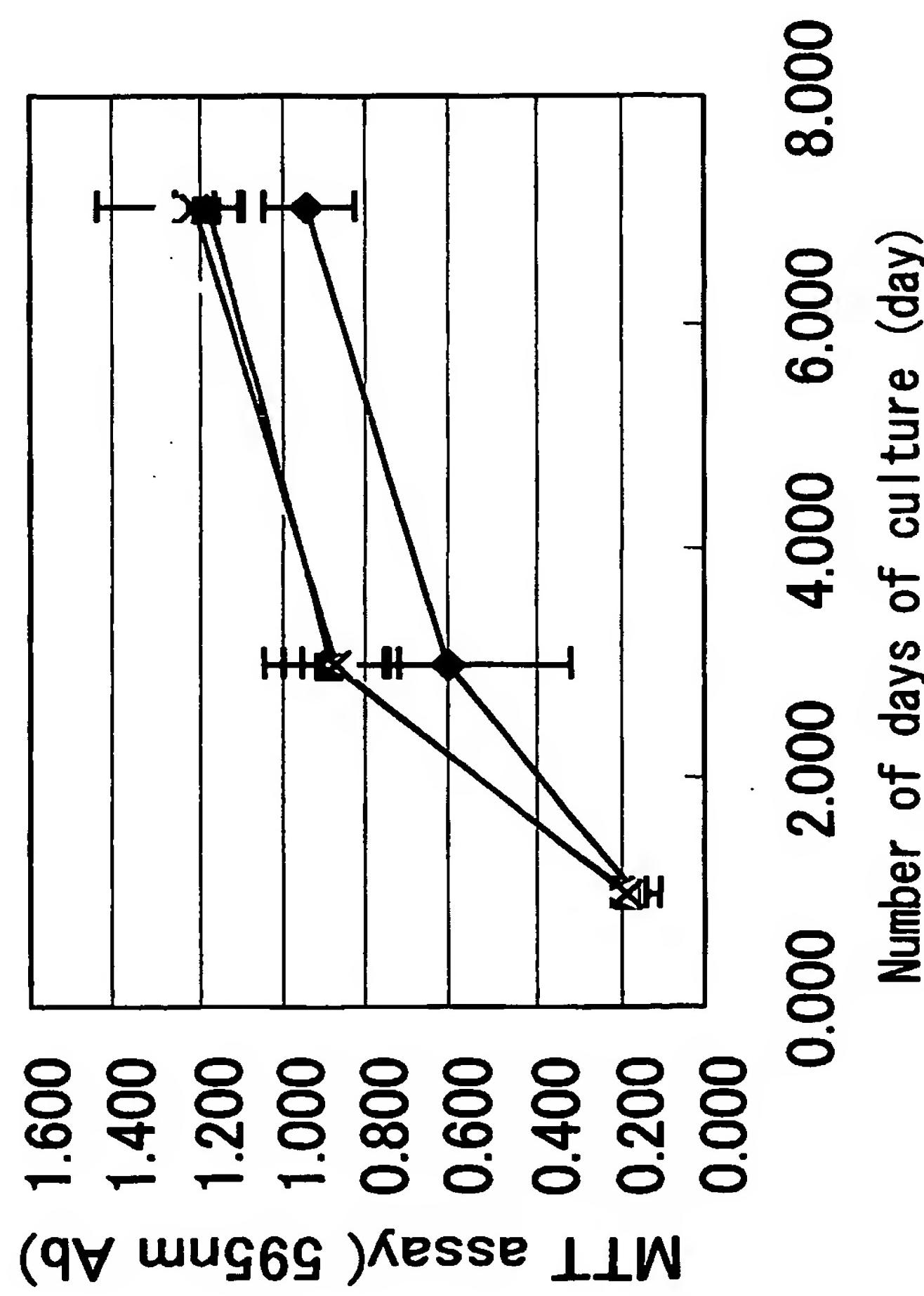
FIG.47



56/64

FIG.48

## Cell growth test (vascular smooth muscle cell)



57/64

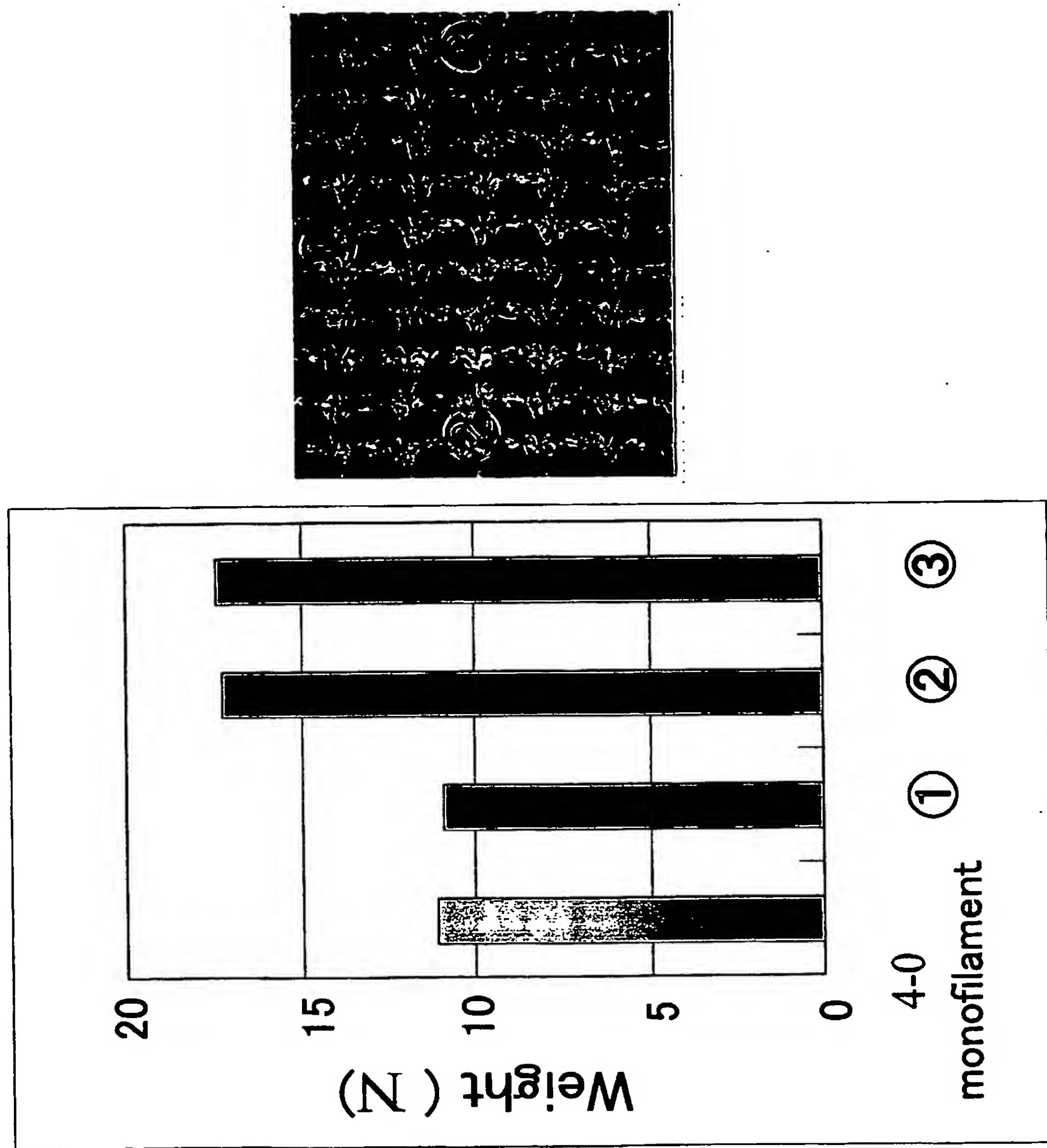
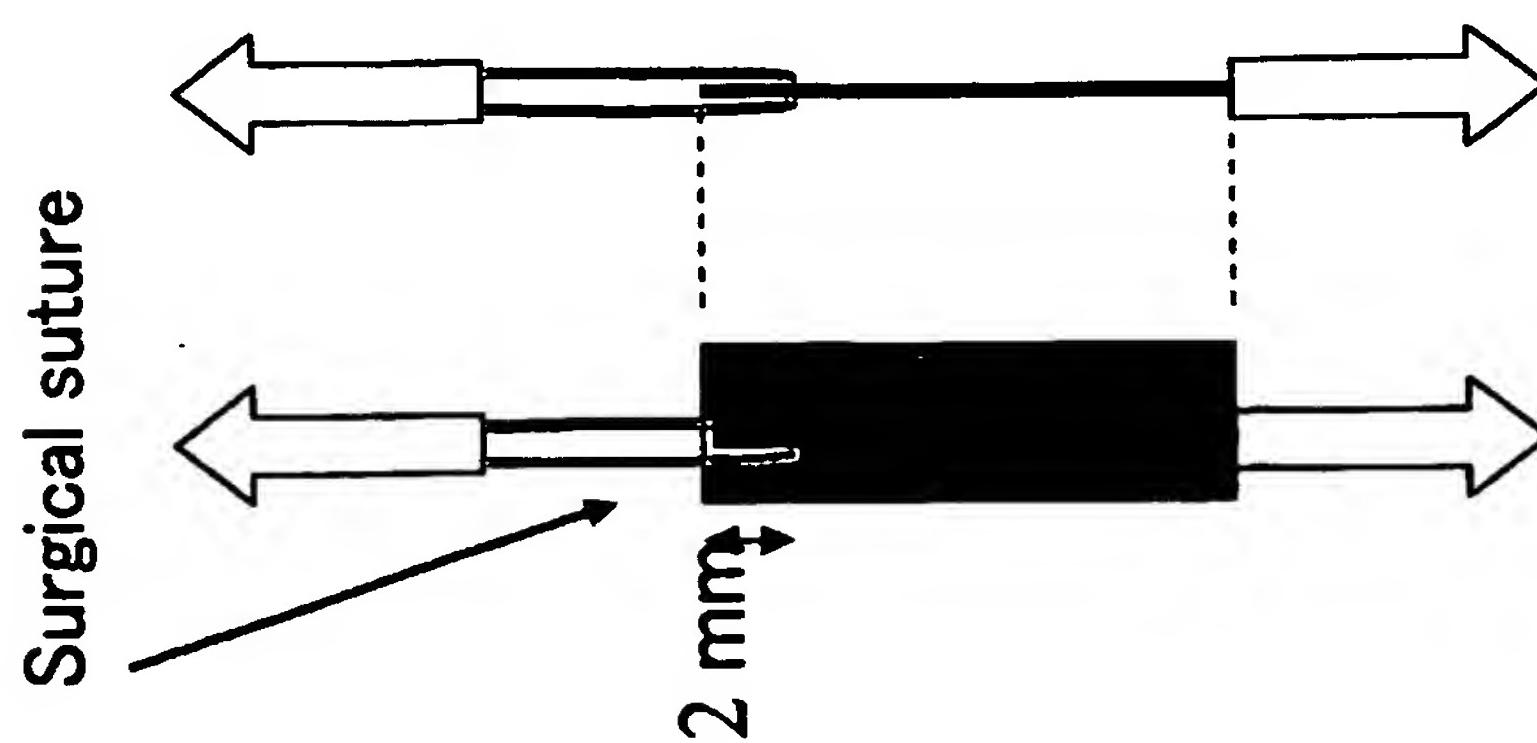


FIG.4.9



58/64

KNIT + WOVEN : リサイクル化繊・天然繊維混紡織物 (2M)

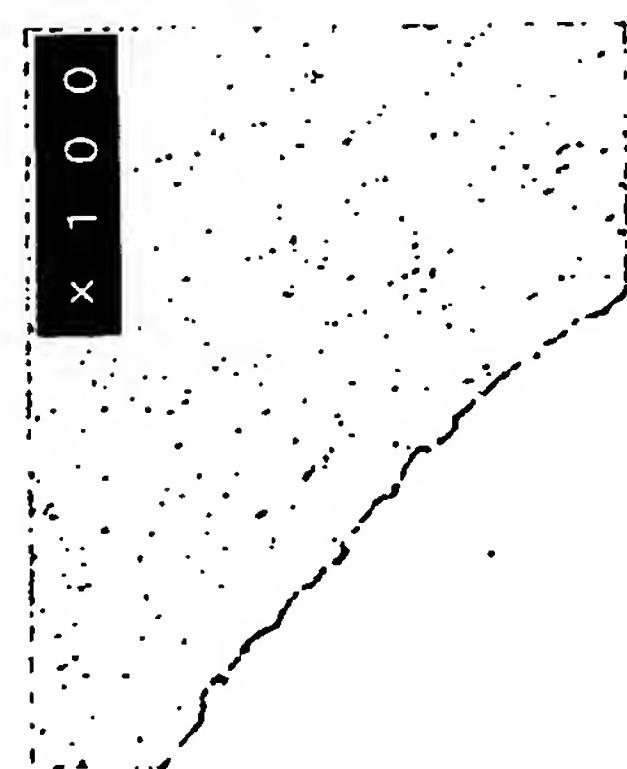
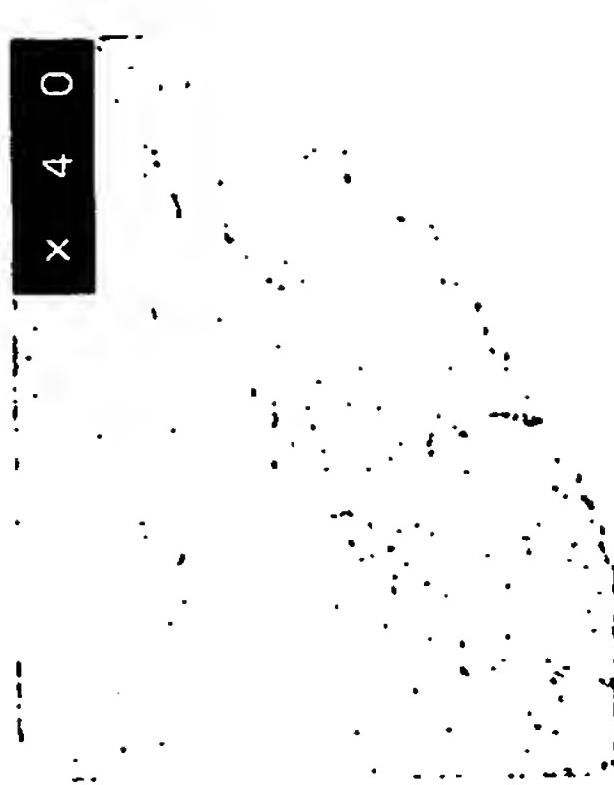
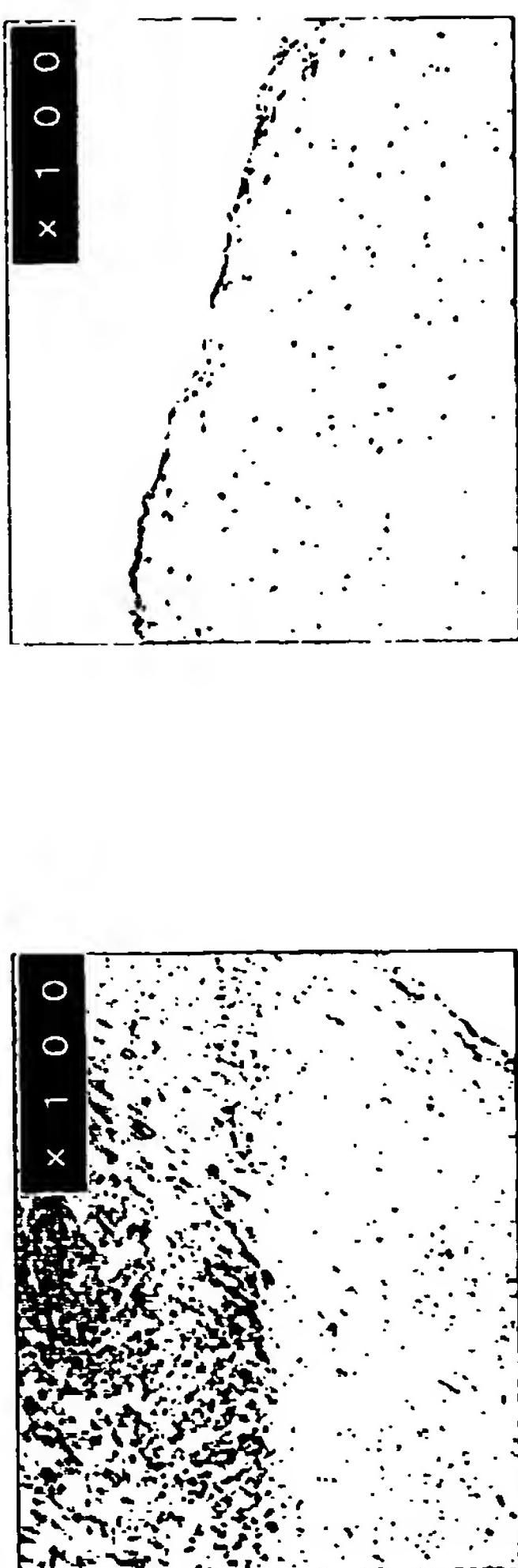
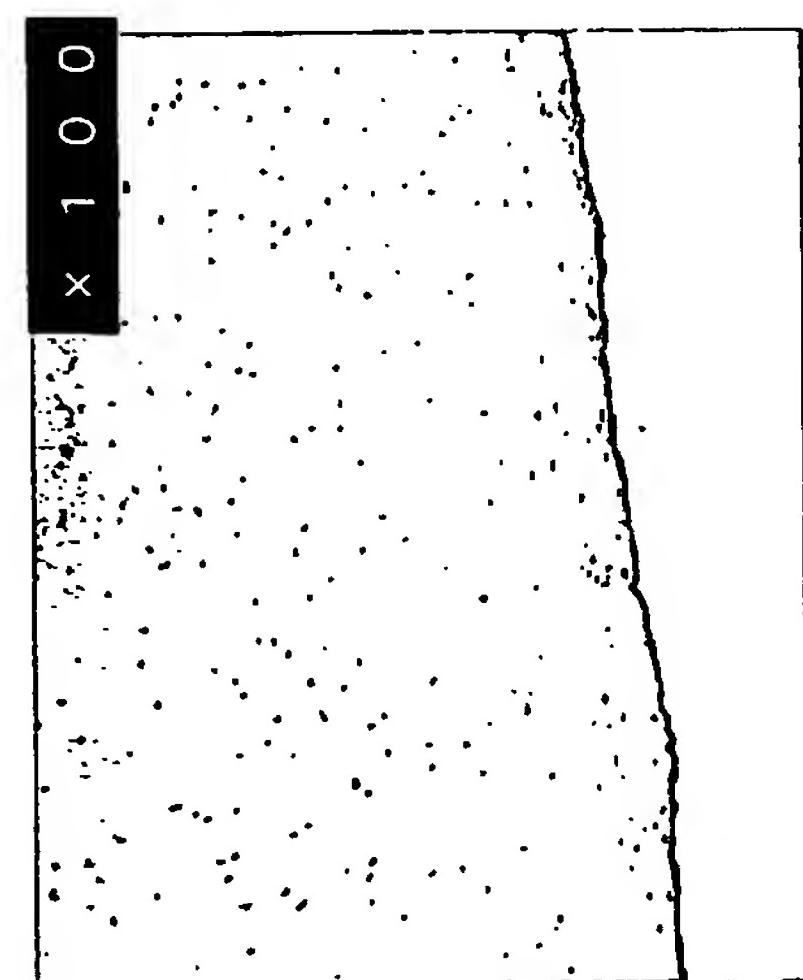


FIG.50

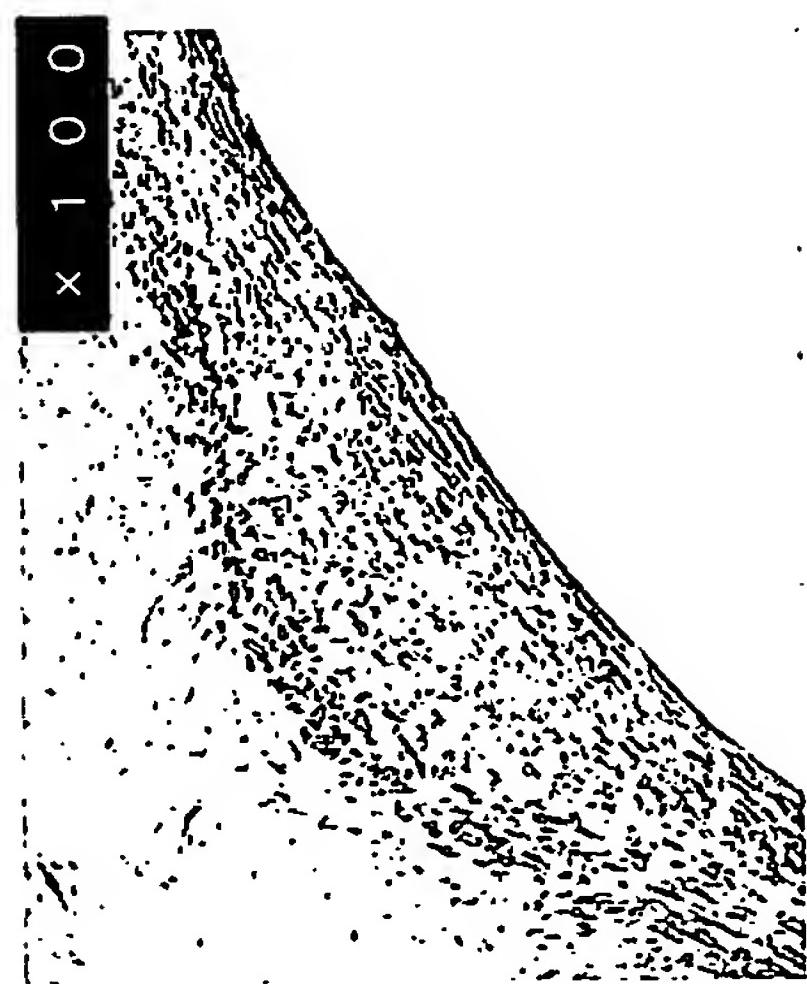
59/64

**FIG.51**

© 2004. Mitsubishi Chemical Corporation. All Rights Reserved.



PLGA patch (re-cellularization)



60/64

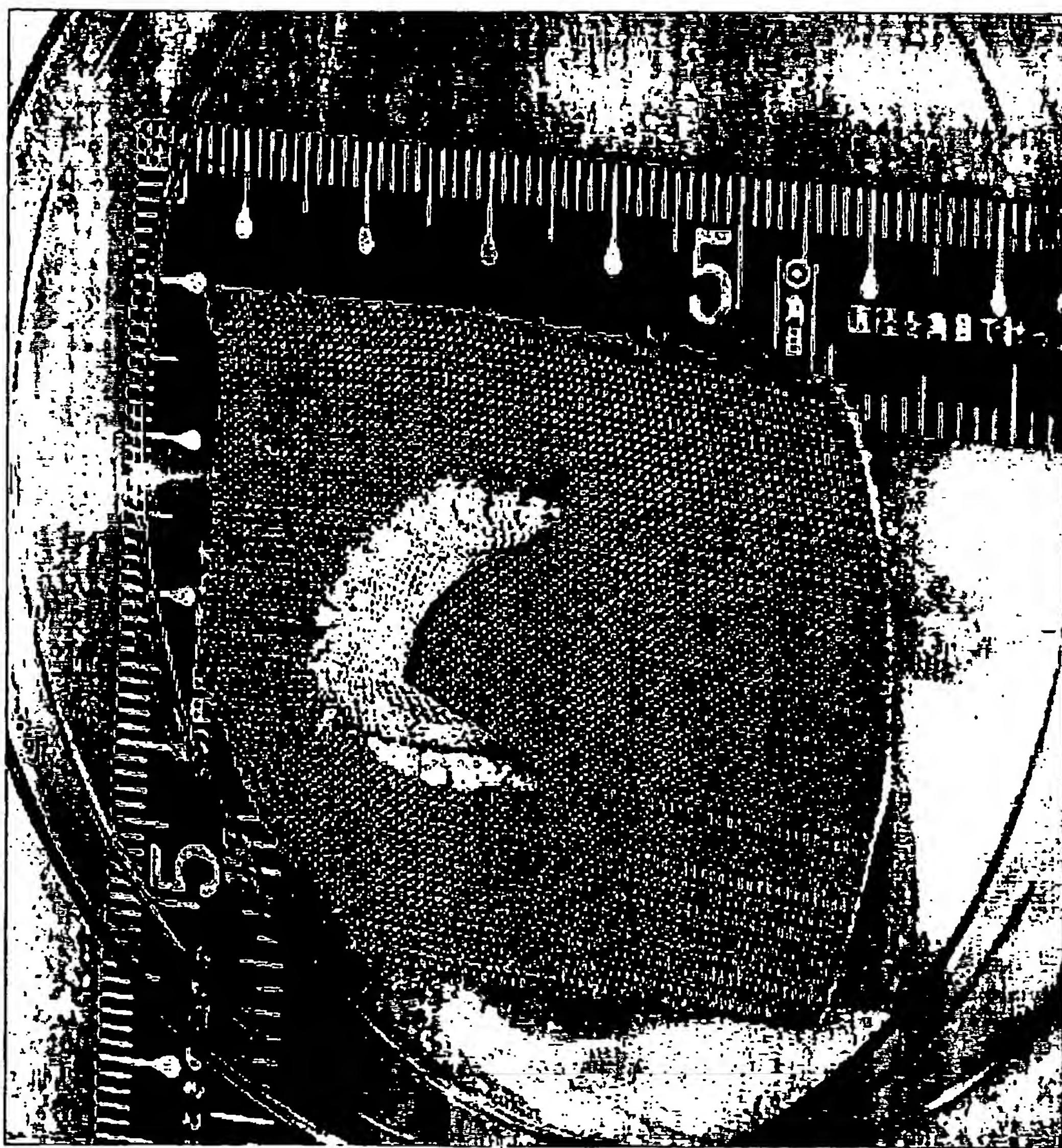


FIG.52

61/64



FIG. 53

62/64

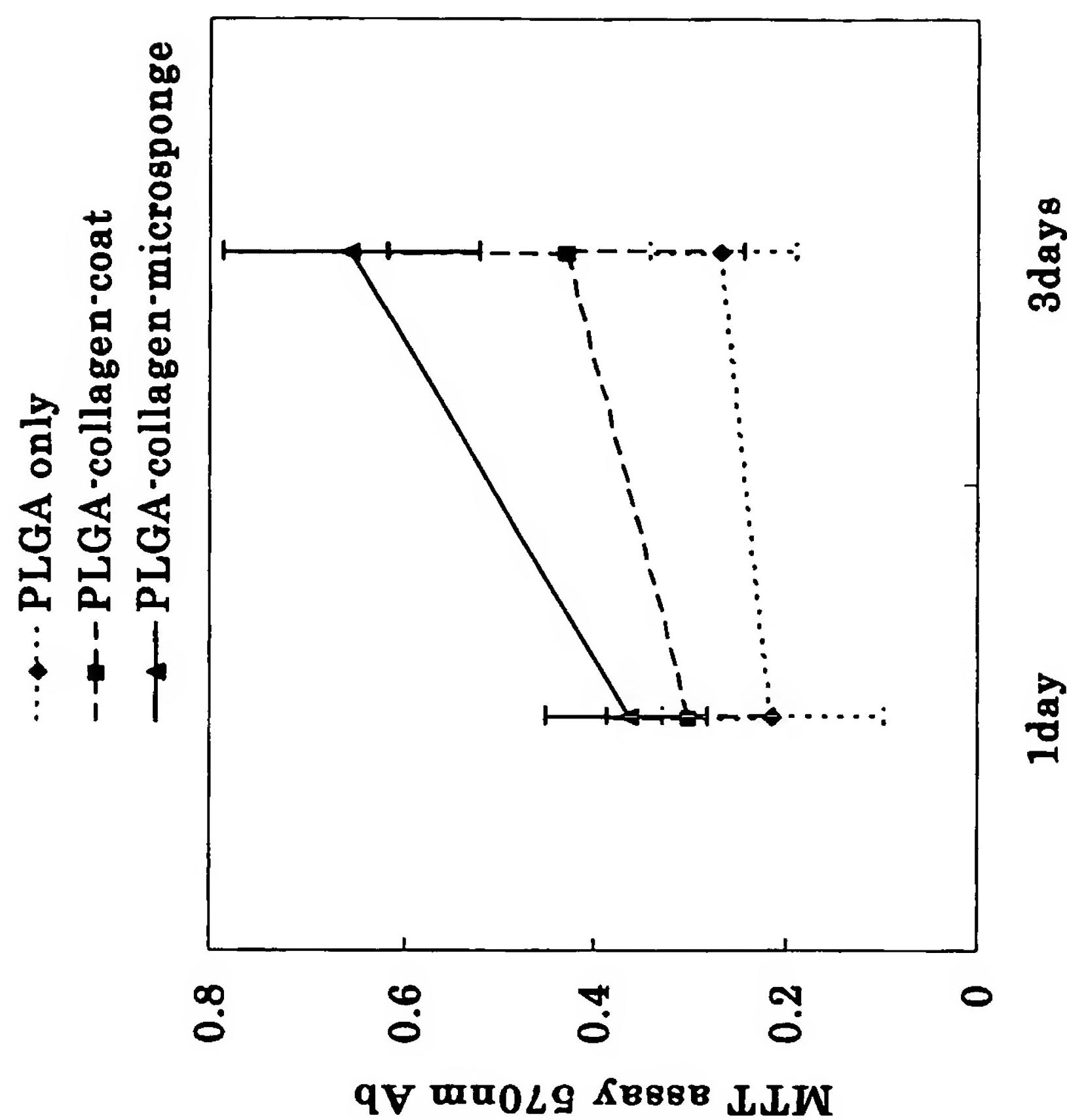


FIG. 54

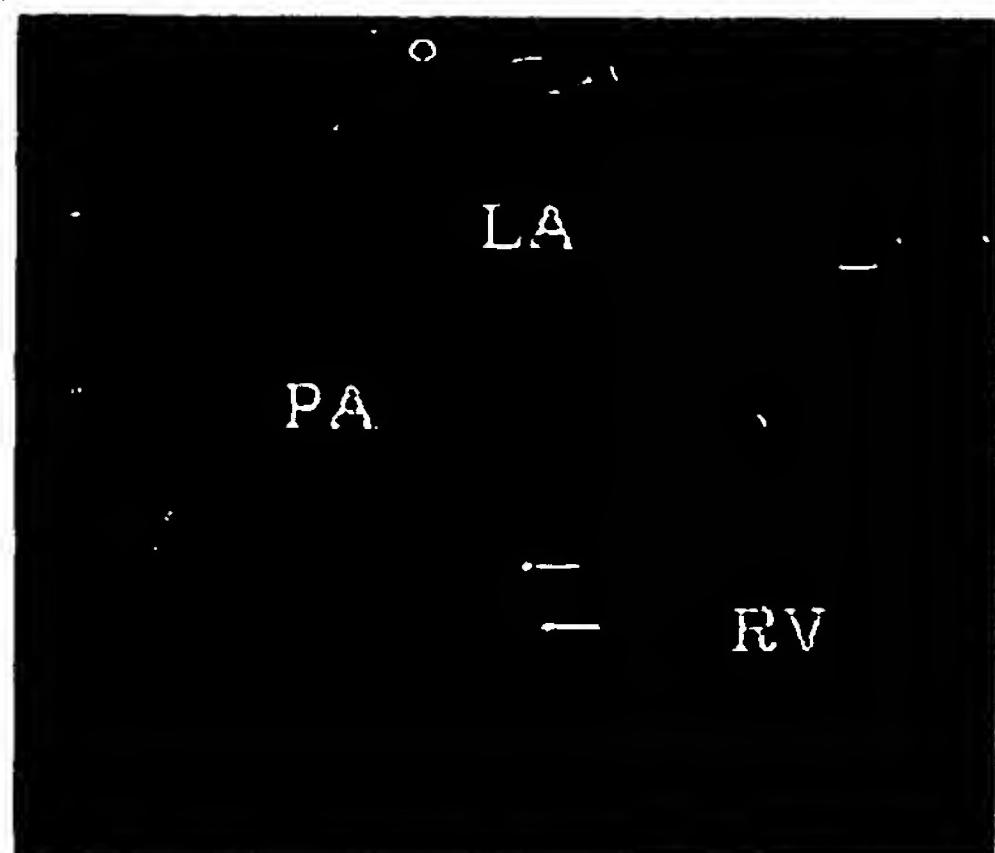
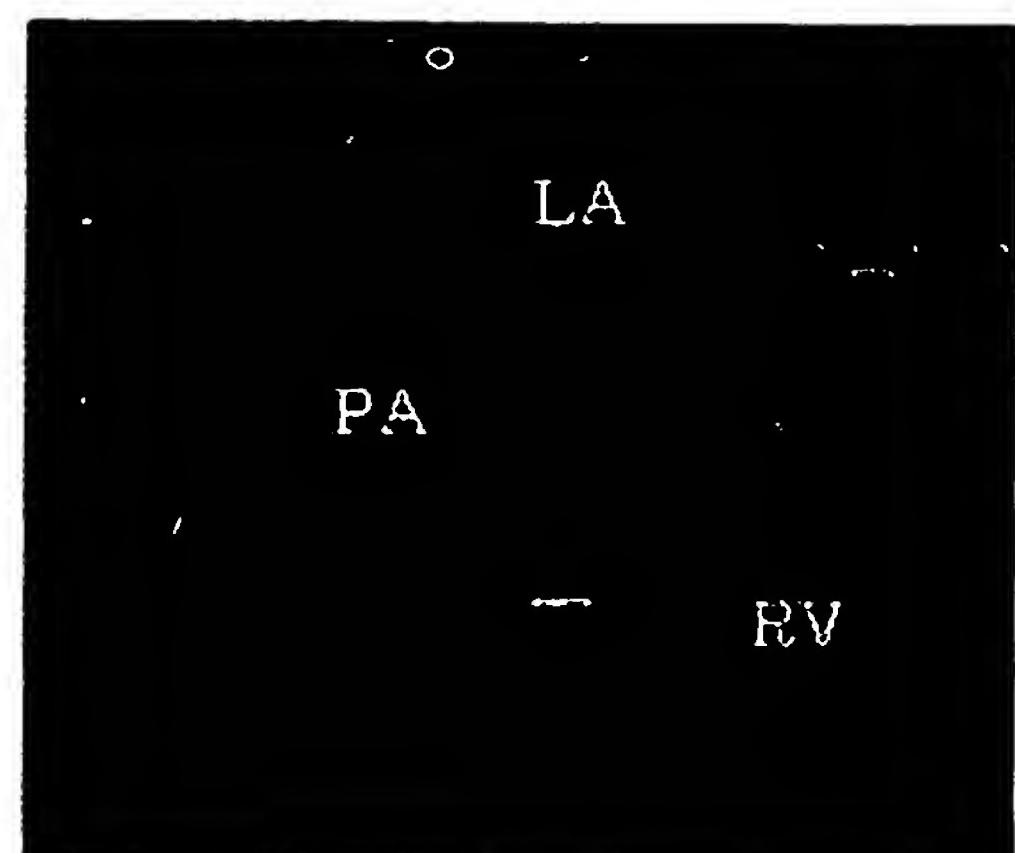
63/64



FIG.55

64/64

# FIG.56

**TEE (diastolic phase)****TEE (systolic phase)****RVG (L)****PAG (L)**

**This Page is Inserted by IFW Indexing and Scanning  
Operations and is not part of the Official Record**

**BEST AVAILABLE IMAGES**

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- BLACK BORDERS**
- IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**
- FADED TEXT OR DRAWING**
- BLURRED OR ILLEGIBLE TEXT OR DRAWING**
- SKEWED/SLANTED IMAGES**
- COLOR OR BLACK AND WHITE PHOTOGRAPHS**
- GRAY SCALE DOCUMENTS**
- LINES OR MARKS ON ORIGINAL DOCUMENT**
- REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
- OTHER:** \_\_\_\_\_

**IMAGES ARE BEST AVAILABLE COPY.**

**As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.**